

Report on Public Hearings

**Rural Municipality of Brokenhead
(Garson, Tyndall, and Henryville)
Water/Sewer Infrastructure Project**

Commissioners Presiding:

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**Manitoba Clean Environment Commission
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Foreword

The United Nations *International Year of Freshwater – 2003*¹ serves to remind us that freshwater is precious and essential for life. Clean uncontaminated water is vitally important to satisfy basic human needs and to maintain regional and global ecosystems.

Much of rural Manitoba derives its domestic water supply from groundwater aquifers and the integrity of such sources determines the quality of the water drawn from these aquifers. In turn, the disposal of water used for human endeavours (wastewater) often determines whether degradation of the water source takes place. Not only is the water supply for human consumption affected, the quality of the medium supporting the ecosystem in which we live can be seriously compromised.

On July 21, 2000, the Manitoba Department of Health issued a boil-water order to the Rural Municipality (RM) of Brokenhead for the community of Tyndall. On July 27, a similar order was issued to the village of Garson. The contamination of the groundwater supply with fecal coliform organisms from individual malfunctioning sewage systems (both septic fields and holding tanks) led to the issuance of this order. Throughout the course of dealing with the Garson-Tyndall-Henryville water system licensing issue, it has become increasingly evident that it is very easy for the integrity and quality of water resources to be seriously threatened.

The Clean Environment Commission hearing process to address these issues was well served by both the RM of Brokenhead and the Devil's Creek Watershed Coalition, which came to the hearing determined to give first priority to the health of the citizens of their community and the need for a reliable water supply and an effective wastewater disposal system.

This hearing report describes yet another situation in which Manitoba freshwater use has reached a crisis situation, and the health of communities that rely on these water resources for quality of life are threatened. Although the recommendations in this hearing report largely are specific to the RM of Brokenhead and particularly the communities of Garson, Tyndall, and Henryville, they have broad implications for the maintenance of Manitoba's freshwater resources for future generations.

¹ United Nations International Year of Freshwater: www.un.org/events/water/

Executive Summary

In July 2000, the residents of the village of Garson and of the Rural Municipality (RM) of Brokenhead were served with a boil-water advisory. Tests had shown that many wells were contaminated, presumably by malfunctioning septic tanks, septic fields, and holding tanks. Further, the capacity of the lagoon situated northwest of the unincorporated community of Tyndall had been exceeded.

Officials of the municipality engaged the services of the engineering firm, J.R. Cousin Consultants Ltd., to assess the situation and prepare a preliminary design for a combined water and wastewater system for the communities of Garson, Henryville, and Tyndall.

The RM of Brokenhead (The Proponent) called public meetings to discuss the financial aspects of the proposed project. Many residents of the municipality at large were deeply concerned with various aspects of the proposal, but were not allowed to raise their concerns at the public meeting.

Some of the concerns raised by the residents had also been raised by members of the provincial Technical Advisory Committee (TAC) and by members of the federal review committee. Among these concerns were the proximity of the proposed lagoon to Devil's Creek, the siting of the well, and the routing of the forcemain within the Devil's Creek riparian zone.

Unable to obtain satisfactory answers, concerned residents called on the province to hold consultation meetings or a hearing. The Minister of Conservation subsequently called upon the Clean Environment Commission (CEC) to hold a hearing and the hearing took place in Garson on June 19 & 20, 2003, continuing on August 18 & 19.

The Proponent proposed a central well located at Henryville from which water would be piped to all three communities. Likewise, it proposed a central sewage treatment system consisting of a lagoon designed to handle wastewater at standard urban water consumption rates (360 L per person per day) for the next 20 years. The proposed system was to be situated adjacent to Devil's Creek and just beyond a 300-metre buffer from several rural homeowners outside the communities but within the RM of Brokenhead and the neighbouring RM of St. Clements. The plan proposed that the forcemain be routed to the lagoon via the riparian zone of Devil's Creek. The proposal was consistent with current practice and did not include any option for tertiary treatment of the wastewater.

Based on the information presented at the hearing, the Panel believes alternative sites for the lagoon were not adequately evaluated and shares the concerns of residents, the TAC, and the federal review committee regarding the routing of the forcemain within the riparian zone of Devil's Creek. In addition, the proposed site for the community well was not optimized for water quality considerations. The plan called for the use of reverse osmosis (RO) as a water treatment technology (plus chlorination) to provide long-term protection of public health.

Little information was presented to the public at the hearing about the extent and quality of the water resource outside the immediate area chosen. Nor was any analysis provided of the potential cost benefits to be derived from the use of a less sophisticated treatment technology.

The Commission recommends that an Environment Act Licence be issued to the RM of Brokenhead for a water/wastewater infrastructure project with the following conditions:

- The community well should be sited to optimize raw water quality and diminish the need for the use of sophisticated treatment technology.
- The new community sewage system based on lagoon technology should either expand the existing site to the west or expand the proposed site to the east, incorporating at least a 30-metre buffer zone between the toe of the lagoon dike and the boundary of the riparian zone of Devil's Creek.
- Forcemains should not be routed within the Devil's Creek riparian zone.
- To meet the requirements of the provincial *Principles and Guidelines of Sustainable Development*, tertiary treatment of the wastewater should be mandated within a designated timeline, and the size of the overall system should be designed to incorporate water conservation technologies at the household level (e.g., low-volume flush toilets) to enable the residents to continue their water conservation ethic while reducing the overall quantity of water required for everyday life.
- Finally, to deal with the groundwater contamination problem at source and to minimize the overall cost to individual homeowners, the Commission recommends that a gravity system be given full life-cycle evaluation. The proposed low-pressure system retains several components of the existing system that are the cause of the groundwater contamination problem and also requires that the homeowner pay a substantial individual hook-up cost in addition to paying for the installation of the centralized system through increased taxation.

The Panel's recommendations appear in full in Section 7 of this Report. Section 6 contains observations and advice to the Minister on related issues.

The Commission is sensitive to the hardships experienced by the citizens living under the boil-water advisory and recommends that a license be issued in a timely manner, but within the conditions recommended in the report. The recommendations have been formulated to provide an enduring solution to the problem and to be consistent with the *Manitoba Nutrient Management Strategy*, the *Lake Winnipeg Action Plan*, the *Manitoba Water Strategy*, and the *Principles and Guidelines of Sustainable Development*.

1. Introduction

On July 21, 2000, the Office of the Chief Medical Officer of Health issued a boil-water advisory to the citizens of the Rural Municipality of Brokenhead living in the community of Tyndall in view of the seriously compromised groundwater based water supply in portions of the municipality. On July 27th, a similar order was issued for the Village of Garson. A significant number of individually operated wells had shown evidence of contamination with fecal coliform organisms. The contamination was linked to the fact that many of the septic fields or holding tanks used by individual homeowners in the municipality were leaking and contaminated water was making its way into the aquifer. The community of Tyndall already had a sewage lagoon, but it was being overloaded. It served a portion of Tyndall through a low-pressure forcemain system and also received the sewage and septage hauled in from households in the village of Garson, the community of Henryville, and the unserved portion of Tyndall.² In addition, the lagoon was receiving trucked-in septage and sewage from an undefined number of households from the RM of Brokenhead at large.

It was decided to construct a sewage disposal system with the capacity to serve Garson, Tyndall, and Henryville, and the RM of Brokenhead became the sponsoring governing body to do so. The RM of Brokenhead, the proponent of this plan, retained the services of J.R. Cousin Consultants Ltd. who spoke on behalf of the proponent during the hearing.

On March 26 2002, the Rural Municipality of Brokenhead submitted an Environment Act Proposal for licensing the construction and operation of water and sewer infrastructure to serve the communities of Garson, Tyndall, and Henryville (Exhibit #11). A provincial Technical Advisory Committee (TAC)³, and a federal government review committee with representatives from Fisheries and Oceans Canada, the Canadian Environmental Assessment Agency of Environment Canada, and the Prairie Farm Rehabilitation Administration (PFRA) of Agriculture and Agri-Food Canada was given the task of reviewing the submission. Members of the public and members of the TAC raised concerns about the location of the lagoon and its potential impact on Devil's Creek. The TAC also objected to the location of the well to be used for the centralized domestic waster system.

² The communities of Tyndall and Henryville are unincorporated and are therefore administered through the Rural Municipality of Brokenhead. The Village of Garson sits on the boundary between the RM of Brokenhead and the RM of St. Clements and was incorporated separately until January 1, 2003, when it became a local unincorporated district (LUD) within the RM of Brokenhead. As a village, Garson had a mayor; each RM has a Reeve and Council.

³ The Technical Advisory Committee (TAC) membership comprised Christine Kabernick, Manitoba Agriculture & Food (Soils and Crops); Patricia Badertscher, Culture, Heritage, and Tourism (Historic Resources); Dr. Jim Popplow, Manitoba Health (Public Health); Joe Romeo, Transportation and Government Services (Highway Planning & Design); Ernie Armitt, Industry, Trade, & Mines (Mines Branch); Juliane Schaible, Energy, Science, & Technology (Life Sciences); David Jopling, Intergovernmental Affairs (Provincial Planning Services); Blair McTavish, Manitoba Conservation (Sustainable Resource Management); Dan McNaughton, Director, Liaison & Guidance, Environment Canada (Canadian Environmental Assessment Agency), federal representative as liaison from the federal review committee.

Twenty-seven requests for a public hearing, two requests for a public meeting, and several general public comments on the proposal were filed with Manitoba Conservation objecting to the submitted proposal. In addition, 114 signatures on correspondence submitted to the Minister supporting the proposal were also received.

In a letter dated March 25, 2003, a year after the Environment Act Proposal had been filed, the Minister of Conservation requested that the Clean Environment Commission conduct a public hearing pursuant to clause 6(5)(b) of *The Environment Act*⁴. The Commission was to receive public comments and concerns regarding the Environment Act Proposal respecting the proposed sewer and water infrastructure development for the RM of Brokenhead. In his letter, the Minister requested that the Commission provide a report to the Minister of Conservation providing advice and recommendations in accordance with Subsection 7(3) of *The Environment Act*.

1.1 Terms of Reference for the Hearing

The Minister requested that the Commission review the Environment Act License Proposal and report on the following issue:

- whether an Environment Act License should be issued respecting the Rural Municipality of Brokenhead Water/Sewer Infrastructure Project proposal.

Should the Commission recommend issuance of a licence, then appropriate recommendations should be included in the report respecting the following:

- the lagoon location relative to Devil's Creek and nearby residences;
- the lagoon and water treatment plant operations and the related potential impacts on Devil's creek regarding fish and wildlife habitats, general water quality and downstream uses such as irrigation and recreational activities;
- the proposed location of the forcemain within riparian areas of Devil's Creek; and
- the potential for contamination of the proposed well at the proposed site.

In addition, the Clean Environment Commission recommendations were to incorporate, consider, and directly reflect, where appropriate, the *Principles of Sustainable Development* and *Guidelines for Sustainable Development* as contained in the *Sustainable Development Strategy for Manitoba*.⁵

⁴The Manitoba Environment Act: web2.gov.mb.ca/laws/statutes/ccsm/e125e.php

⁵Sustainable Development Strategy for Manitoba,
www.gov.mb.ca/conservation/susresmb/pub/strategy/index.html

1.2 Existing Government Policies, Strategies, and Directions

The following documents describing Manitoba government policies, strategies, and objectives are mentioned in view of their relevance to the proposed development:

*Manitoba Water Quality Standards, Objectives, and Guidelines*⁶

Manitoba's *Water Quality Standards, Objectives, and Guidelines* provide for the protection of surface and ground water and overall ecosystem integrity. This document has been subjected to public, stakeholder, and technical review, and is at the final draft stage. Standards, objectives, and guidelines are provided for over 100 substances including dissolved oxygen, nutrients, fecal coliform, metals, etc. They are provided as Tier I Standards, Tier II Objectives, and Tier III Guidelines. The three-tiered approach is used to consolidate and harmonize Manitoba's approach with other programs across Canada.

A variety of scientific management tools and management strategies are used in a proactive manner to protect, maintain, and rehabilitate water quality in Manitoba. Two water quality management strategies are used simultaneously. First, all developments and waste discharges are controlled to the extent that is reasonably practical and economically feasible using a consistent technology-based approach. Second, when more stringent environmental controls are required to protect important water uses, a water quality-based approach is used. Additional environmental limits are imposed to ensure that applicable water quality standards, objectives, and guidelines are not exceeded.

Modifications are made to the *Water Quality Standards, Objectives, and Guidelines* as the region-specific or site-specific objectives are developed, and new principles relating to environmental protection in Canada are formulated through national processes such as that used through the Canadian Council of Ministers of the Environment (CCME)⁷.

*Manitoba Nutrient Management Strategy*⁸

A draft *Nutrient Management Strategy* for southern Manitoba was released for public review in 2000 to address the issue of enrichment of Manitoba's surface waters with plant nutrients such as nitrogen and phosphorus. The draft *Nutrient Management Strategy* identified the main challenges, tasks, and issues that will have to be considered in the development of appropriate water quality objectives for prairie

⁶Manitoba Water Quality Standards, Objectives and Guidelines,
www.gov.mb.ca/conservation/watres/website_notice_mwqsog_2002.html

⁷Canadian Council of Ministers of the Environment: www.ccme.ca/

⁸Manitoba Nutrient Management Strategy (in progress 2002), proposal from CEC outlined at
www.cecmanitoba.ca/files/Nutrient_Management_Strategy_Consultation.pdf

streams and receiving lakes such as Lake Winnipeg. As required, the strategy also involves development of an implementation plan if reductions of nutrient loadings are required. The strategy is scheduled to undergo public and stakeholder review before being finalized in 2004.

*Lake Winnipeg Action Plan*⁹

A six-point *Lake Winnipeg Action Plan* was announced by the Minister of Conservation at the Freshwater Forum¹⁰ held by the Clean Environment Commission in Winnipeg during February 2003. The Action Plan provides for the establishment of a Lake Winnipeg Stewardship Board to help Manitobans identify further actions necessary to reduce phosphorus (by 10%) and nitrogen (by 13%) to pre-1970 levels subject to further findings of Manitoba's *Nutrient Management Strategy*. Other actions in the plan included enhanced riparian protection, better programs for soil testing, tightened regulations for sewage and septic systems, and additional requirements for larger treatment systems. Data presented at the Freshwater Forum showed the need for such an action plan because of degradation of the quality of Lake Winnipeg through the influx of nutrients and microbiological contaminants.

*Manitoba Water Strategy*¹¹

The *Lake Winnipeg Action Plan* was subsequently incorporated in April 2003 into the *Manitoba Water Strategy* which was announced soon after the Freshwater Forum. The goal of the *Manitoba Water Strategy* is to develop watershed-based planning across the entire province to ensure that future management of specific water issues is done in an integrated fashion to help to improve water quality and ecosystem integrity in Manitoba freshwater systems. A sustainable approach is required to ensure that all needs are met while maintaining ecosystem protection. The strategy identifies six interrelated policy areas: water quality, conservation, use and allocation, water supply, flooding, and drainage. The objective of Manitoba's water quality policies is to protect and enhance aquatic ecosystems by ensuring that surface and ground water quality is adequate for all designated uses and ecosystem needs. The use and allocation objective is to ensure the long term sustainability of the province's surface and ground water for the benefit of all Manitobans.

⁹Lake Winnipeg Action Plan, www.gov.mb.ca/chc/press/top/2003/07/2003-07-18-05.html

¹⁰Freshwater Forum: www.cecmanitoba.ca/start.cfm?SC=1&PT=3&MID=4&EV=13

¹¹Manitoba Water Strategy, Powerpoint slide presentation, June 2002:
www.amm.mb.ca/images/resources/WaterStrategy.htm

*Principles and Guidelines of Sustainable Development*¹²

The *Principles and Guidelines of Sustainable Development* were adopted in 1996 as a basis for all Manitoba government activities. A full discussion of the ways in which the proposal and the recommendations of the Clean Environment Commission incorporate, consider, and directly reflect, where appropriate, the *Principles of Sustainable Development* and *Guidelines for Sustainable Development* as contained in the *Sustainable Development Strategy for Manitoba* appears in Section 5 of this report.

1.3 Background

On March 26, 2002, the RM of Brokenhead submitted an Environment Act Proposal for the construction and operation of a sewer and water infrastructure system consisting of a new sewage lagoon, new sewage forcemains, new water well and treatment system and new associated water mains and secondary lines (Exhibit #11). This proposed development was to serve the village of Garson and the communities of Tyndall and Henryville in the Rural Municipality of Brokenhead for a 20-year period (Figure 1). The area population is currently about 1,000 and is projected to increase to 1,232 by 2023. The development proposal is subject to environmental approval under both the *Manitoba Environment Act* and the *Canadian Environmental Assessment Act*¹³.

Domestic water in the Garson-Tyndall-Henryville area is currently derived from individual private wells. Many of these wells have tested positive for high levels of total coliform and fecal coliform. The Manitoba Medical Officer of Health issued boil-water advisories in July 2000 that are to remain in effect until a municipal water and sewer treatment system is operational serving each of the three communities. The Medical Officer of Health has further directed that should the current problem not be corrected, individual homeowners will be responsible for eliminating any sources of groundwater contamination that originate on their property.

On May 14, 2002, the Medical Officer of Health, Dr. Jan Roberts, reiterated this order in correspondence to the Mayor and Council of the Village of Garson (Exhibit # 9):

Please be advised that the boil water advisory issued for the Village of Garson on July 27, 2000 will remain in effect until such time that a municipal water and sewer system is in place to provide an alternate source of safe, potable drinking water and to collect and adequately treat municipal waste water, and existing wells contaminating the aquifer are properly corrected or abandoned.

¹²Principles of Sustainable Development and Guidelines for Sustainable Development as contained in the Sustainable Development Strategy for Manitoba, www.gov.mb.ca/conservation/susresmb/principles-susdev/

¹³Canadian Environmental Assessment Act: www.ceaa-acee.gc.ca/0011/act_e.htm

Should the municipal sewer and water system not proceed, individual homeowners will be ordered to correct or abandon defective wells and to replace or repair leaking or inadequate septic fields consistent with the requirements of provincial legislation and such work shall be carried out entirely at the homeowner's cost. Under this situation, the boil water advisory would not be lifted until such time that historical bacteriological testing has confirmed that all sources of contamination have been addressed.

The communities have dealt with extraordinary difficulties in living with the boil-water advisory these past three years. Since individual septic fields and holding tanks are likely the source of the problem, the provision of a centralized sewage collection and treatment system should reduce the potential for further contamination of the groundwater and protect human health.

Figure 1 RM of Brokenhead Proposed Location of Sewer and Water Systems

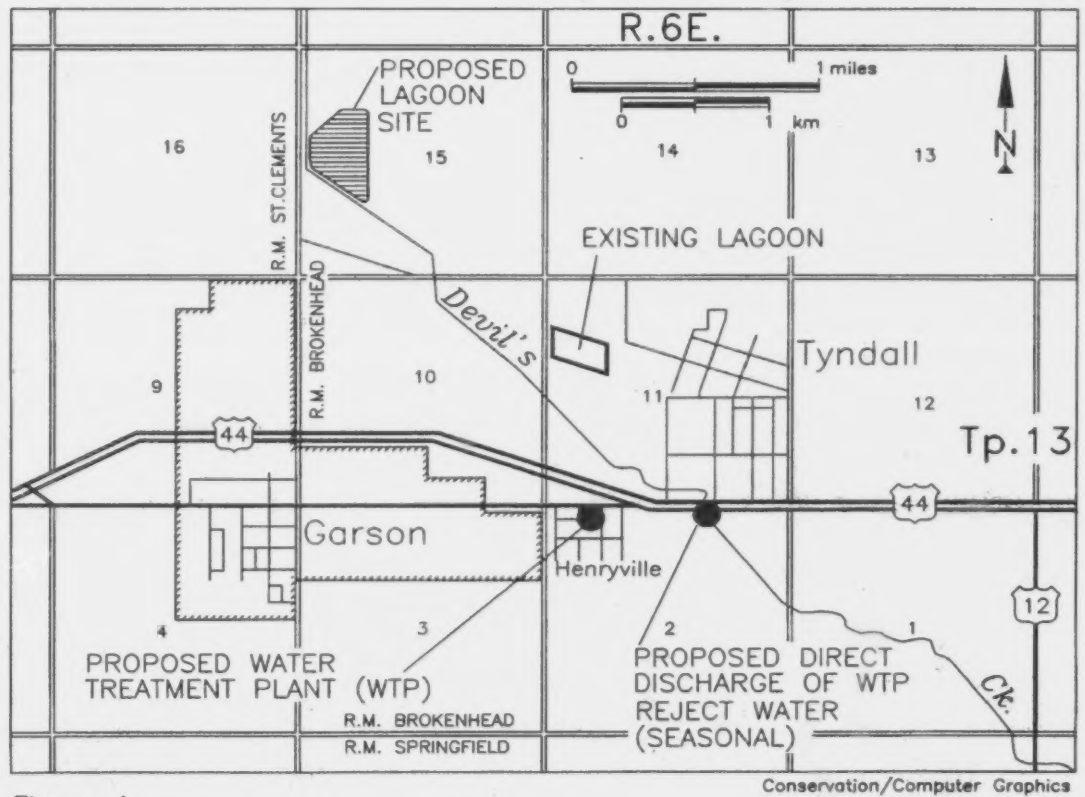


Figure 1.
Rural Municipality of Brokenhead Water/Sewer Infrastructure Project.

Map provided by Environmental Approvals Branch, Manitoba Conservation.

1.4 Environment Act Process in Manitoba

Municipal drinking water and wastewater treatment facilities constitute developments in Manitoba (Class I and Class II, respectively) and thus require licensing. Under the Manitoba Environment Act, a licensing process is prescribed requiring the preparation of an Environment Act Proposal (EAP) as part of the environmental assessment process. A proposal must be filed and an Environment Act Licence obtained prior to the construction, alteration, or operation of a development. The EAP is vetted by a Technical Advisory Committee (TAC) appointed by Manitoba Conservation and is filed in the Public Registry and thus made available for public scrutiny.

The Environmental Approvals Branch of Manitoba Conservation is responsible for the process and its role under the Act is to ensure that pertinent information relating to the environmental impacts of a development proposal is available to the decision-making authority. Accordingly, the Director of Environmental Approvals makes licensing decisions for certain classes of developments and issues the licence. Upon the direction of the Minister of Conservation to do so, the Clean Environment Commission conducts public hearings on such issues and provides recommendations to the Minister. While the Minister is not bound to follow these recommendations, he must give a detailed explanation in writing if he or the Director of Environmental Approvals issues the licence containing conditions at variance with those recommendations.

In Manitoba, both the federal and provincial governments can have a role in environmental approval and licensing. The two governments operate under the provisions of the *Canada-Manitoba Agreement on Environmental Assessment Cooperation*¹⁴ signed in May 2000. Under this agreement, when both the *Manitoba Environment Act* and the *Canadian Environmental Assessment Act* come into play, Manitoba Conservation and the federal government departments conduct environmental assessments concurrently and cooperatively. In addition, partial funding for this proposed project has been approved under the *Canada-Manitoba Infrastructure Program Agreement*¹⁵. Therefore, in addition to satisfying the requirements of the Manitoba Environment Act, an Environmental Assessment under the CEAA must be completed prior to Western Economic Diversification Canada making the final decision to provide the funding.

¹⁴Canada-Manitoba Agreement on Environmental Assessment Cooperation,
www.gov.mb.ca/conservation/envapprovals/publs/can-man-agreement.html

¹⁵Canada-Manitoba Infrastructure Program Agreement,
www.infrastructurecanada.gc.ca/icp/partners/mb_agreement_e.shtml

1.5 Environment Act Proposal

In providing assistance to the RM of Brokenhead, the Manitoba Water Services Board¹⁶ (an arm's length board established by the province and reporting to the Department of Intergovernmental Affairs¹⁷), pursuant to the *Manitoba Water Services Board Act*¹⁸, requested a pre-design report for a municipal water and sewer system for the three communities. J.R. Cousin Consultants Ltd., working on behalf of the municipality, prepared a report identifying the ground water resources, recommended water treatment and distribution systems, and a recommended wastewater collection and sewage treatment system, each designed for a 20 year growth period.

The environmental assessment for the RM of Brokenhead was pursued as a cooperative environmental assessment conducted in accordance with the provisions of the *Canada-Manitoba Agreement on Environmental Assessment Cooperation*, with Manitoba as the lead agency.

Public participation is a cornerstone of both the Canadian Environmental Assessment Act (CEAA) and the Manitoba Environment Act. As one of the mechanisms to ensure compliance with the legislation, federal representatives participate in the Manitoba Technical Advisory Committee process that provides technical advice from specialists within the provincial government on developments proposed for licensing under the *Manitoba Environment Act*.

Following the advertised closing date of the Environment Act Proposal (EAP) on May 20, 2002, for receipt of comments on the proposed development from both the TAC and the public, Environmental Approvals (Manitoba Conservation) continued to seek additional information from the proponent, based upon concerns expressed regarding a number of aspects of the Environment Act Proposal.

¹⁶ Manitoba Water Services Board, www.gov.mb.ca/ia/programs/water_services.html

¹⁷ As of November 4, 2003, the MWSB reports to the Minister of the newly created Department of Water Stewardship.

¹⁸ Manitoba Water Services Board Act, www.canlii.org/mb/sta/ccsm/20030602/c.c.s.m.c.w90/whole.html

1.6 Public Hearing

There was urgency in dealing with the Environment Act Proposal for the RM of Brokenhead sewer and water infrastructure because of the recognized health concern associated with the boil-water advisory. Concern over the length of time it was taking to resolve and respond satisfactorily to these issues resulted in numerous letters to Manitoba Conservation. Some local residents requested a public hearing or a public meeting while others supported the Environment Act Proposal as submitted. This controversy resulted in the Minister directing the Clean Environment Commission to hold a public hearing.

The CEC conducted the hearing on June 19 and 20, 2003, in the Garson Community Hall. The hearing continued on August 18 and 19, 2003. The Minister of Conservation determined that Participant Assistance Program¹⁹ funding, to a maximum of \$10,000, should be made available to qualified intervenors. In order to establish who might have access to these funds, the CEC established a separate Panel to hear the applications for participant assistance and that Panel awarded \$5,500 to the Devil's Creek Watershed Coalition, a coalition of individuals made up largely of representatives from the community.

¹⁹ Participant Participation Program: in accordance with Manitoba Regulation 125/91

2. Public Hearing Process

2.1 Clean Environment Commission

The Manitoba Clean Environment Commission is an arms-length provincial agency that operates under the authority of *The Environment Act*. The Commission encourages and facilitates public involvement in environmental matters, and provides advice and recommendations to the Minister of Conservation on sustainable development, environmental issues and licensing matters. Its mandate is exercised through public hearings, investigations, mediation and education. Membership on the Commission includes a full-time Chairperson and fifteen part-time Commissioners appointed by Order-in-Council. The Commission office is staffed with the Commission Secretary, the Technical Advisor, and the Administrative Secretary. The hearing Panel for each matter referred to the Commission consists of a number of Commissioners selected by the Chairperson and chaired by the Chairperson of the Commission or his designate. While the Minister is not bound by the Recommendations of the Commission, as mentioned earlier, he is obliged either to follow the recommendations or provide a detailed explanation in writing for not following them.

2.2 Mandate and Scope of the Hearing

In a letter dated March 25, 2003, The Minister of Conservation requested that the Clean Environment Commission conduct a public hearing pursuant to clause 6(5)(b) of *The Environment Act* to receive public comment and concerns regarding the proposed sewage and water treatment systems for the RM of Brokenhead.. The Commission was to provide a report to the Minister of Conservation providing advice and recommendations to the Minister in accordance with Subsection 7(3) of *The Environment Act*.

The Commission's review was to include:

whether an Environment Act Licence should be issued respecting the Rural Municipality of Brokenhead Water/Sewer Infrastructure Project proposal.

Should the Commission recommend issuance of a licence, then appropriate recommendations were requested in the report from the Commission respecting the following:

lagoon location relative to Devil's Creek and nearby residences;
lagoon and water treatment plant operations and related potential impacts on Devil's creek regarding fish and wildlife habitats, general water quality and downstream uses such as for irrigation and for recreational activities;
proposed location of forcemain within riparian areas of Devil's Creek; and
potential for contamination of the proposed well at the proposed site.

In addition, the Commission was instructed to incorporate, consider, and directly reflect, where appropriate, the *Principles of Sustainable Development* and *Guidelines for Sustainable Development* as contained in the *Sustainable Development Strategy for Manitoba* in its recommendations.

2.3 Notice of Public Hearing and Participant Assistance Program

The Manitoba Clean Environment Commission provided a Notice of Public Hearing and of a Participant Assistance Program in the Winnipeg Free Press, April 26, 2003, and in the Selkirk Journal and the Beausejour Clipper, April 28, 2003. This information plus the location of the hearing was also published on the CEC website.²⁰ These advertisements also advised the public that applications for participant assistance to access a fund with an amount capped at \$10,000 were to be received on or before May 9, 2003. One applicant group, the Devil's Creek Watershed Coalition, with Ms Jane Seniw as the Coordinator, applied for funding. The coalition was awarded an amount of \$5,500 based on recommendations of a Panel consisting of CEC Commissioners Mr. Nick Carter (Chairperson), and Mr. Ken Gibbons.

The public hearing was scheduled for June 19 and 20, 2003, in the Garson Centennial Centre, in the village of Garson, Manitoba. The Panel of Commissioners presiding for the Rural Municipality of Brokenhead: Garson/Tyndall/Henryville Water/Sewer Infrastructure Project public hearing consisted of Mr. Gerard Lécuyer (Chairperson), Ms Lissa Donner, and Dr. Barrie Webster.

2.4 Hearing Schedule and Format

The hearing opened in the Garson Community Centre on the evening of June 19, 2003, and continued until the evening of June 20. It consisted of opening remarks by the chairperson, and presentations by the Rural Municipality of Brokenhead (the proponent), J.R. Cousins Consultants Ltd., on behalf of the proponent, Manitoba Conservation, various representatives of the Devil's Creek Watershed Coalition and members of the public. Cross-examination took place by the Panel and by other participants following the presentations.

The hearing reconvened on August 18, 2003, and continued on August 19 with further presentations by representatives of the Devil's Creek Watershed Coalition, Manitoba Health, Manitoba Conservation, the Canadian Environmental Assessment Agency, Canada Department of Fisheries and Oceans, Prairie Farm Rehabilitation Administration, the Canada Manitoba Infrastructure Program, Rural Municipality of St. Clements, the St. Clements Rate Payers Association, and the Rural Municipality of Brokenhead, in addition to a number of presentations from members of the public. Extensive cross-examination of presenters by the Panel, each other and the public took place. A list of all registered presenters is provided in Appendix A.

²⁰Manitoba Clean Environment Commission website: www.cecmanitoba.ca

The public hearing was recorded and a transcript (available in both printed and electronic forms) was produced for the public record.

2.5 Attendance

An estimated 300 to 325 individuals including private citizens, municipal government representatives, local land owners, business representatives, federal and provincial government staff, members of the Devil's Creek Watershed Coalition, environmental specialists, consultants, and the general public attended the public hearing.

2.6 Exhibits

A total of 39 exhibits were recorded during the hearing and are listed in Appendix B.

3. The Garson-Tyndall-Henryville Current System and the Proposal

Although it makes up a small geographic area within the RM of Brokenhead, the Garson-Tyndall-Henryville area (Figure 1) is one of the more important settlement areas in the municipality, and is likely to grow since it has become a bedroom community for the City of Winnipeg. It encompasses a combined population of approximately 1,000 residents and is located on a major highway (Highway 44). One of its businesses, associated with the limestone quarry, has produced a building stone known as Tyndall stone, which has been used extensively for many decades in Manitoba and across Canada.

3.1 Existing Waste Water Disposal Practices and Needs

As is typical of many small communities in Manitoba, the sewer and water services in the three communities comprise primarily private wells, septic tanks and fields, and pump-out holding tanks. The southern portion of Tyndall is currently serviced by a sewage lagoon located approximately 600 m to the west of the community (Figure 1). The lagoon and the accompanying low-pressure forcemain system were put into service 17 years ago. Septage²¹ is also hauled to the Tyndall lagoon from individual septic tanks and sewage from holding tanks in the three communities. In addition, an undefined number of rural residents of the RM of Brokenhead at large also use the current lagoon to dispose of septage and holding tank pump-out material. As the community and the use of the lagoon have expanded, the existing lagoon is no longer able to meet the requirements of the three communities and therefore the system must be modified or replaced.

3.2 Existing Domestic Water Sources and Problems

Although the groundwater resources have been plentiful, with wells tapping into both an upper aquifer and a lower, more extensive aquifer, it is believed that contamination of the upper aquifer has occurred in Garson and Tyndall as a result of saturated septic fields and surface runoff. Improperly constructed wells are identified as a major component of the possible pathways of contamination into the aquifer. The lower aquifer is less vulnerable in that it lies beneath a layer of solid, carbonate rock, reported to be 40 meters thick in one test well. But there are a number (undefined) of wells in Garson and Tyndall that extend into this aquifer. Unless these wells are properly cased and grouted, they are potential pathways of contamination from the upper to the lower aquifer.

²¹ Septage: solid material or liquid removed during periodic maintenance of a septic tank or an aerobic treatment unit (Environment Act regulation 83/2003).

The tragic consequences of contaminated drinking water sources have been exemplified by the contamination of the domestic water supply and the resulting deaths and illnesses in Walkerton, Ontario, during 2000, and this heightened interest in domestic water quality in many Manitoba communities. Test results for water samples taken from many private wells in the Garson/Tyndall area in 2000 showed evidence of contamination. Fecal coliform contamination discovered in subsequent testing of wells in a more comprehensive sample resulted in the issuance of a boil-water advisory. The Medical Officer of Health, in issuing the boil-water advisories in July 2000 instructed that the order remain in effect until a municipal water and sewer treatment system was operational serving the communities involved. She further stated in a later letter dated May 14, 2002 (quoted in Section 1.3 above (Exhibit #9)), that if the conditions leading to the issuance of the boil-water advisory were not satisfactorily dealt with, then she would direct that the problems be corrected by each homeowner wholly at their individual expense.

3.3 Progress toward a Comprehensive Solution

Although the three communities initially embarked upon a plan to improve their sewer and drinking water services independently, a plan evolved that proposed to improve the systems for all three communities together. The RM of Brokenhead accessed the expertise of the Manitoba Water Services Board (MWSB), and, through the services provided by both the MWSB and J.R. Cousin Consultants Ltd., a proposal was developed to provide a new sewage lagoon, holding tanks, low-pressure forcemains, a centralized well and water treatment plant, and the associated water distribution lines to serve all three communities.

The same firm had previously prepared a report entitled "*Feasibility Study and Report for the Village of Garson Proposed Sewer System*" in February 1990. The report outlined an assessment of a low-pressure sewer system for the village of Garson alone and identified two potential lagoon sites. Although that material was referenced as a backdrop to the more recent work undertaken by J.R. Cousin Consultants Ltd., it was not submitted as evidence during the CEC hearing.

3.4 The Proposed Development

In February 2002 J.R. Cousin Consultants Ltd. compiled a report entitled "*R.M. of Brokenhead, Village of Garson, Community of Tyndall, Community of Henryville - Municipal Water and Sewer System Pre-Design Report*" (Exhibit #4). Among other inclusions normally contained in a pre-design report, this report also provided an assessment of the topography and geo-technical reviews of the area, the existing sewer and water infrastructure, design population, land requirements, and preliminary costs estimates. It also included a report on the soil characteristics of the preferred site for the proposed lagoon. Based upon this work, funding in principle was obtained from the *Canada-Manitoba*

*Infrastructure Fund*²² for the proposed sewer and water infrastructure subject to the completion of a suitable design and an approved Environmental Impact Assessment.

The RM of Brokenhead then proceeded with the preparation of an Environmental Submission for the *Proposed Garson/Tyndall/Henryville Water/Sewer Infrastructure Project* dated March 25, 2002 (Exhibit # 11). As part of the normal public input and vetting process, the proposal was placed on the Public Registry and sent to the Technical Advisory Committee (TAC) for review and input on April 15, 2002.

The proposed project includes the construction of a new sewage lagoon adjacent to Devil's Creek some distance downstream from the existing lagoon, which is to be decommissioned. Residential systems are to be evaluated and connected, each with its own small lift station pump, to a low-pressure forcemain system, which will feed the sewage to the lagoon. The domestic water supply system is to be centralized in the unincorporated settlement of Henryville, midway between Garson and Tyndall. In view of possible future contamination of the ground water, the proposal includes the installation of a reverse osmosis (RO) system at the well site to process all water before chlorination and distribution to the households in the three communities.

Initial requests for additional information from the Environmental Approvals Branch (Manitoba Conservation) were sent to J.R. Cousin Consultants Ltd. on June 20, 2002, (Exhibits #3) and the responses were provided to Environmental Approvals and the TAC in September and October of 2002. Following the distribution of these responses to both the TAC and the public, supplementary requests for additional information were sent to J.R. Cousin Consulting Ltd. (December 2002).

3.5 Comments and Concerns about the Proposal

Between January 26 and February 27, 2003, the Environmental Approvals Branch received letters requesting further information and expressing concerns regarding several aspects of the Environment Act Proposal (EAP). These included comments from the public, the TAC and the Federal representatives participating in the review. Some of the more significant concerns are outlined below:

The proposed lagoon location provides an inadequate buffer zone between the lagoon and Devil's Creek.

The proposed lagoon location allows the bare minimum setback for several nearby residences, some of which are in the adjacent RM of St. Clements.

Quality and quantity of lagoon effluent and water from the treatment plant to be discharged to Devil's Creek is unacceptable.

The location of the sewer forcemain within riparian areas of Devil's Creek is unacceptable.

²² Canada-Manitoba Infrastructure Fund, Canada-Manitoba Infrastructure Program,
www.infrastructure.mb.ca/e/news001011i.html

There is significant potential for contamination of the well at the proposed site with both infiltrating sewage seepage and surface water.

A well site other than the one proposed should be explored.

There is limited information respecting alternative lagoon sites.

There is limited information respecting the selection process followed to identify the proposed site.

Alternative wastewater treatment options have not been evaluated or discussed.

As a result of continued deficiencies, numerous requests were received for a public hearing or a public meeting. Others provided general comments speaking in opposition to various aspects of the Environment Act Proposal (EAP). Correspondence was also received supporting the EAP.

3.6 No Industrial Use of the New System

Currently, the existing lagoon has no industrial users. There are several existing local businesses that are serviced either by the low-pressure system in Tyndall or by septic fields or holding tanks in Garson. Further, there is no industrial/commercial use planned for the proposed system, neither the water supply nor the wastewater disposal system; no new industrial uses are anticipated in the future.

4. Issues Raised During the Hearings

A number of key issues were raised during the hearing:

1. hurdles encountered during the Environment Act Proposal process;
2. sewage treatment technology to be used;
3. sewage lagoon location and design;
4. Devil's Creek as the receiving waters for treated effluent and reject water from the water treatment plant;
5. community health and the siting of the proposed lagoon;
6. design of the residential sewage collection system;
7. water supply issues;
 - a) ground water resources – availability and quality considerations
 - b) choice of location of proposed well
 - c) proposed treatment technology required for drinking water
8. environmental Impact Statement deficiencies; and
9. other issues.

A concluding statement summarizing the discussion and views of the Panel is highlighted at the end of each issue. This information on issues is presented as background in support of the Panel's recommendations to the Minister. There is no implied "order of importance" to the sequence in which the issues are presented.

4.1 The Environment Act Proposal Process – Difficulties along the Way

Boil-water advisories were issued on July 21, 2000, to the Reeve and Council of the Rural Municipality of Brokenhead (respecting the village of Tyndall) and on July 27, 2000, to the village of Garson (Exhibit #6). Following these events, the RM of Brokenhead sought the assistance of the Manitoba Water Services Board (MWSB) to help determine a plan of action. At this point, the village of Garson was not part of the RM of Brokenhead, but it had its own challenges to meet regarding community wastewater disposal. The boil-water advisories brought the water issues of the three communities into sharp focus, but the administrative challenges they faced were somewhat extraordinary.

4.1.1 Project Funding – Canada-Manitoba Infrastructure Fund

Acting on the advice of the MWSB, the RM of Brokenhead submitted an application to the *Canada-Manitoba Infrastructure Fund* toward the end of 2000 to qualify for project selection commencing January 2001. Because the funding application was being considered for approval under the *Canada-Manitoba Infrastructure Agreement*, an environmental assessment under the *Canadian Environmental Assessment Act* (CEAA) had to be completed prior to Western Economic Diversification making a final decision with respect to project funding (Exhibit #26). The Canada-Manitoba Infrastructure Secretariat (which administers

the funding on behalf of Western Economic Diversification Canada) in turn contracted the Environmental Services Group of the Prairie Farm Rehabilitation Administration (PFRA - Agriculture and AgriFood Canada) to administer the federal assessment on behalf of Western Economic Diversification Canada.

Prior to the submission of the application to the *Canada-Manitoba Infrastructure Fund*, the RM of Brokenhead passed a resolution on November 24, 2000, "authorizing a feasibility study to investigate the possible installation of a municipal water and sewage system." Upon receipt of the feasibility study report from J.R. Cousin Consultants Ltd., the RM decided to proceed with the project.

On March 27, 2001, the Rural Municipality of Brokenhead was awarded \$4 million (of the total \$6 million estimated cost of the project) conditional on the approval of the project by Manitoba Conservation. Obtaining this approval was one of the conditions for this funding. (Although PFRA had been contracted to perform the environmental assessment, the environmental approval is provided by the Province. Should the federal government not be satisfied by the findings of this assessment, the federal government could conduct its own environmental assessment. If, following that process, the federal government determined that the proposed development did not meet its environmental standards, then the federal portion of the funding could be withheld). The remaining \$2 million would have to be raised from the taxpayers of the RM of Brokenhead.

4.1.2 Impediments to local government efforts to troubleshoot the problem

At the hearing, it became obvious that several levels of government had had difficulties serving the citizens of the municipality satisfactorily even before the boil-water advisory was issued. Testimony given at the hearing described the way in which assistance had been requested by the RM Council and the difficulties that had been experienced. A councilor of the RM of Brokenhead related, that when he first learned about a contaminated well, he had sought assistance from the public health officer, the regional office of Manitoba Conservation, and the provincial Water Resources and Drinking Water Office (formerly Manitoba Conservation and now Manitoba Water Stewardship), but had received no help. Generalized testing of the water in the community was finally supported (some \$5000 being made available) but only on the condition that the councilors themselves do the legwork. Help to trace possible contamination routes from suspect septic systems or holding tanks was refused by some homeowners, in part, because the individual systems were on private property and RM officials did not believe that they had the authority to conduct inspections on private property without the owner's consent. The frustration level was high. Help was finally successfully sought from the Manitoba Water Services Board at the recommendation of the Regional Health Association.

The Panel also heard evidence from Councillor Dudek of the RM of Brokenhead that the Council only learned of the contamination from a concerned citizen who had had his own well privately tested, not from the responsible provincial authorities. Councillor Dudek also testified that when he contacted the Public Health Inspector he was advised that that office was aware of more than one contaminated well in the Tyndall area. Councillors expressed shock that they had not been notified.

4.1.3 Impediments to Inputs from Concerned Citizens

Participants in the CEC hearings argued that, throughout the planning process, the opportunities for citizens to provide input into the plan and the proposal had been limited. Although the RM of Brokenhead had held public meetings regarding the financing of the project, little opportunity had been provided for inputs into the concept and design of the proposed sewer and water treatment plan. The municipality had formed a local committee with representatives from Garson, Tyndall, and Henryville to examine and recommend to the RM Council the fairest way to finance the project. Based upon this information, the municipality had proceeded to a public meeting in order to present a plan for financing the proposed system.

Because the public meeting that had been called by the Rural Municipality dealt with financing, only those who had been identified as potential payers for the project had been allowed to participate fully. There had been no general public dialogue about any alternative proposals. No opportunity had therefore been provided for the public to make input other than through the normal provincial vetting process for Environmental Act Proposals. During the CEC hearing itself, Reeve Tymko of the RM of Brokenhead welcomed the Commission's involvement as an opportunity for issues to be presented.

4.1.4 Lack of Opportunity to Question Government Expertise

Provincial government employees who were members of the TAC were not present at the hearing for questioning. While members of Manitoba Conservation did appear before the Panel to answer questions, there was no opportunity for participants in the hearing to hear the justification first hand from the TAC members for the decisions that had been made and the criticisms that they had raised. Questions from Panel members about the concerns raised by TAC members therefore remained unanswered during the hearing.

Further, the federal government representatives who appeared before the Commission responded to substantive technical questions by Panel members by providing comments on process, only. Objections of a technical nature had been submitted by these same departments in the course of the vetting process; however, no further discussion was forthcoming at the hearing. During the hearing, residents expressed their disappointment that federal government representatives would not provide substantive technical and regulatory information.

4.1.5 Participant Assistance – Input Generated

The Panel received input from the Devil's Creek Watershed Coalition, the only intervenor group funded. Some of the evidence that they presented (e.g., location of artesian wells and sinkholes, environmental impacts downstream on Devil's Creek, and the concern about potential for the breeding of the mosquito vector of West Nile virus) led the Panel to request the appearance of additional experts when the hearing reconvened in August.

4.1.6 Commission Comments, Observations and Conclusions

- *The Commission observed that opportunities for local input into the plan to address the domestic water contamination problem had been limited.*
- *The Commission observed that the responses of the proponent to the residents' concerns and those raised in documentation from the TAC and the federal review committee prior to the calling of the hearing were often inadequate.*
- *The Commission believes it should be able at a hearing to obtain technical evidentiary information from experts within government departments. In order to address the terms of reference and the issues raised at the hearing, Panel members and the public need to be able to ask technical environmental impact assessment specialists to answer questions on subject matter such as ground water, sewage treatment, and environmental impacts of the proposed project.*
- *If the Commission cannot obtain the needed information in this way, it will likely be obliged to call on external expertise to present evidence at future hearings to deal with these kinds of issues.*
- *The Commission was struck by the general unwillingness of the federal representatives at the hearing to address issues that they themselves had raised as concerns during their earlier review of the proposal. Substantive questions from the Commission and the residents remained unanswered because responses from the federal representatives were limited to issues of process. The level of frustration was high and the Panel appreciated the dispassionate approach taken by residents at the hearing.*
- *The Commission was disappointed that obvious concerns from members of the review committees had not been addressed during the process before the hearing had been called. As a result, it appeared that the CEC hearing had been viewed as the opportunity for these concerns to be responded to and cleared up. Had the needs of the community been attended to more carefully and in a timely manner, the hearing might have been considerably shorter or might not have been necessary at all.*

- *The Panel believes that Manitoba Conservation should have used its authority to require the proponent to respond to the concerns raised by the TAC members prior to the start of the hearing. The hearing was called even though the objections of the TAC members had not been adequately addressed.*

4.2 Sewage Treatment Technology to be Used

As part of the planning process for a lagoon, and based upon the position that it might not be possible to expand the existing site, five options for sewage treatment were identified by the proponent. A sixth was added during the hearing. These are:

1. construction of an entirely new lagoon at a new site followed by decommission of the existing Tyndall lagoon;
2. construction of a new lagoon for Garson only and expansion of the Tyndall lagoon to accommodate the growth of the Tyndall community;
3. construction of a mechanical sewage treatment plant;
4. alteration of the existing Tyndall lagoon to convert it into an aerated lagoon and utilization of additional land for storage of the aerated effluent prior to discharge;
5. modification of the existing Tyndall lagoon to serve as the primary cell and construction of a separate secondary cell at a new (preferably adjacent) location; and
6. construction of an engineered wetland

Participants stated that much of the discussion regarding these options had not been made known to them, and even when public meetings had been held, such discussions had not been allowed, as the advertised purpose of the meetings was to discuss financial issues only.

Each of these alternatives is addressed briefly below:

4.2.1 Construction of a new lagoon at a new site

Four sites had been considered by J.R. Cousin Consultants Ltd. on behalf of the proponent. Such a lagoon, with a 30-m buffer zone around it, was estimated to require 23.5 hectares of land. The actual area is, of course, somewhat dependent on the shape of the lagoon; an irregular shaped one (such as that proposed) or an elongated one would require more land, since the length of the perimeter of the lagoon determines the area of the buffer zone, and therefore the total amount of land required.

4.2.2 A new lagoon for Garson only plus expansion of the lagoon for Tyndall

Such an alternative was rejected by the Proponent as being unnecessarily expensive and likely not flexible enough to handle the projected population growth in the overall area. This alternative had been the subject of the earlier study by J.R. Cousin Consultants Ltd.

4.2.3 A mechanical sewage treatment plant

A number of comments from local citizens indicated that this option was attractive to them. The nature of such an alternative was not well described at the hearing; however, evidence was presented by J.R. Cousin Consultants Ltd. that such a treatment plant would be much more expensive than treating the sewage in a conventional lagoon system. No actual cost estimates were presented to the CEC to support this opinion. It was also the opinion of the proponent that mechanical treatment plants for sewage usually are economic only for much larger centres.

4.2.4 An aerated lagoon at the current site

It was the opinion of the proponent that the modification of the existing lagoon to incorporate aeration would require the purchase of an additional parcel of land to store the treated effluent prior to discharge to receiving waters. In the meantime, there would be no lagoon to handle ongoing sewage production from existing users of the current lagoon. Use of the existing site as an aerated lagoon was considered not to be an option since either the primary cell would have to be deepened or an additional storage area would be required. Cost estimates were not provided for this option.

4.2.5 Build new secondary cell adjacent to existing lagoon

In this scenario, the existing lagoon consisting of a primary cell and a secondary cell would have the dividing dike removed. The resulting single cell lagoon would become a primary cell with a new secondary cell being constructed at an adjacent site to the west. This plan would require that the land across the road to the west of the lagoon be acquired and the effluent from the primary cell be piped under the road to the new secondary cell. It was the opinion of the proponent that this option would place the new secondary cell within the 300-m guideline buffer zone. The Panel observed that the residence immediately to the west of the existing lagoon is currently well within the 300-m guideline buffer zone.

4.2.6 Construct an engineered wetland

Evidence was presented by an intervenor at the Hearing, describing a plan under which lagoon effluent would be treated by passage through a constructed wetland and restored to a quality compatible with the local receiving waters. Although the concept was presented, the cost, location, and amount of land required for such an alternative for the municipality was not elaborated upon.

This technology is being used elsewhere for the treatment of both human and livestock effluent. In the course of the cross-examination and during subsequent discussion, it was established that such an engineered wetland is commonly used for the removal of nutrients from wastewater following treatment at the secondary level. While there is information available from authoritative sources describing the use of this technology for the treatment of

raw sewage,²³ winter conditions in Manitoba and the amount of land required may make such an alternative unattractive. As a result, engineered wetlands are likely suitable for use in Manitoba for post-secondary treatment only. Thus, the technology is most suitable to be added onto a lagoon system to make the effluent compatible with the quality of the receiving waters. Since nutrient removal is central to wetland technology, it is important to recognize that effluent from engineered wetlands would have undergone tertiary treatment.

Engineered wetlands are thus often used as an adjunct to the classic two-cell lagoon system to remove nutrients before the water is discharged. To incorporate an engineered wetland into the RM of Brokenhead project would require more land for the system than for a simple two-cell lagoon; however, the quality of the effluent water would be considerably higher.

This alternative was the only one that addressed wastewater treatment in a manner compatible with the stated objectives of the Province of Manitoba, i.e., the *Nutrient Management Strategy*, the *Water Strategy*, the *Lake Winnipeg Plan*, and the *Principles and Guidelines of Sustainable Development* (see above). Even though the policy to adopt the *Principles and Guidelines of Sustainable Development* into all government developments and actions has been in place since 1996, Manitoba Conservation stated that it was not ready to institute such requirements at the present time because the actual means to meet and enforce these principles and guidelines are not yet available to the public.

Mosquito habitat and the risk of harbouring the mosquito vector of West Nile virus, e.g., *Culex tarsalis*, was also discussed as a risk associated with the engineered wetlands type of treatment but no definitive difference from the risk associated with the two-cell lagoon model was given.

4.2.7 Summary of sewage treatment options

Discussion took place during the hearing about the pros and cons of the various options. J.R. Cousin Consultants Ltd. advised that, based upon their assessment, both the mechanical sewage treatment plant option and the aerated lagoon option at the existing site would be problematic and more costly, since sufficient additional storage would be required for either option. After reviewing the options and the costs of each alternative, the Rural Municipality had previously agreed with J.R. Cousin Consultants Ltd. that the construction of a new lagoon to service the entire project area was the preferred option and they had proceeded with their application for the required Environment Act licence. The municipality proceeded with the purchase of the land required at the location for their preferred option.

²³ A number of examples of the use of constructed wetlands in a North American setting for the treatment of sewage (in some cases without pretreatment in primary and secondary lagoon cells) can be found; e.g., www.environmentprobe.org/cw/index.cfm?DSP=links and www.extension.umn.edu/distribution/naturalresources/DD7671.html, describe systems used in Minnesota, scholar.lib.vt.edu/vtpubs/spectrum/sp961031/4a.html described work done in Vermont, and www.fujitaresearch.com/reports/wetlands.html gives a discussion of climatic limitations.

4.2.8 Commission Comments, Observations and Conclusions

- *The Panel recognized the sincere efforts on the part of the Rural Municipality of Brokenhead, the Devil's Creek Watershed Coalition, and the general public in addition to the effort on the part of the RM of Brokenhead to give priority to the health of the people of the community.*
- *The Panel was critical of the interpretation on the part of the proponent leading to their choice of the preferred site and the purchase of land accordingly. The CEC Panel was not convinced that this was the only, or even the best option.*
- *The Panel was concerned that open dialogue did not appear to have taken place on the options and that the alternatives appeared not to have been adequately evaluated and addressed.*
- *The Panel recognized that lagoons are an effective and robust means of domestic wastewater treatment for small communities. The Commission was disappointed that this important point had not been presented in the original Environment Act Proposal and in the responses throughout the Environment Act review process.*
- *Regarding engineered (i.e., constructed) wetlands, the Panel recognized that the wetland technology was most readily available as a tertiary treatment option (in addition to primary and secondary treatment). The Commission subsequently became aware of the use of the constructed wetland technology to provide an overall combination of primary through tertiary treatment for municipal wastewater. The attractiveness of the application of this technology in the Manitoba context may be limited by the climate. Sustainable development requires, on the other hand, that nutrient removal be taken seriously.*
- *The Panel observed that the proponent considered constructed wetlands only after the idea had been introduced by an intervenor. In responding to the intervenor, the proponent stated that the wetlands were suitable to be used only for post-secondary treatment. Manitoba Conservation did not provide information about engineered wetlands as an alternative or as an adjunct to sewage treatment to either the proponent or to the interested community members.*
- *The Panel agreed that it was important to recognize that West Nile virus mosquito breeding sites were a concern.*

4.2.9 Commission Recommendation

- **It is recommended that tertiary treatment of wastewater be required in the licence within a defined timeline. [7.1.1]** (Tertiary treatment of wastewater will be required in Manitoba as part of the prescribed sewage treatment protocol in the near future, especially in view of Manitoba's *Nutrient Management Strategy*, *Lake Winnipeg Action Plan*, and *Water Strategy*, in addition to the adoption by the government of Manitoba in 1996 of the *Principles and Guidelines of Sustainable Development* for application in all endeavours of the government.)

4.3 Sewage Lagoon Location and Design

The Proponent reported that several potential sites had been investigated with respect to suitability for the sewage lagoon. These sites are shown in Figure 2. The design parameters included a population projection and sizing of the proposed facility to function for the 20-year period. According to the proponent, included in this analysis was a consideration of the Manitoba Conservation's environmental guideline for a 300-m buffer zone from the nearest residences.²⁴ It was stated by the proponent that this guideline precluded consideration and further evaluation of a number of the proposed locations.

As indicated above, participants thought that the alternative sites had not been explored fully and that additional information should have been considered before the Council of the RM of Brokenhead proceeded with the purchase of and the planning for the "preferred" site, i.e., that proposed in the Environment Act Proposal.

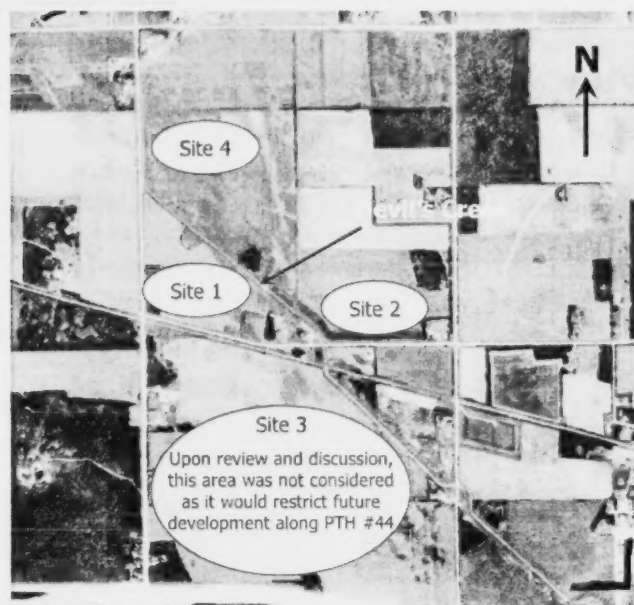
A number of issues concerning the location and design of the sewage lagoon arose:
expansion of the lagoon at the current location
the location of the sewage lagoon proposed by the proponent
alternative locations for a new lagoon

²⁴ Design Objectives for Standard Sewage Lagoons, Province of Manitoba, Environmental Management, July 1985, 5 pp. and Addendum to "Design Objectives for Standard Sewage lagoons" respecting Seepage, July 1985, 2 pp. (see Appendix). Manitoba Conservation advises that these design objectives have been under review since 1985. **There is no regulation in existence based on these objectives.**

Figure 2 Lagoon Siting

(Original slide provided by J. R. Cousins – Exhibit #6)

R.M. of Brokenhead Wastewater/ Drinking Water Proposal LAGOON SITING



New lagoon site options:

Site 1: Too small to construct lagoon with future expansion capabilities

Site 2: Size is limited due to proximity to residences

Site 3: This area would restrict future northerly development along P.T.H. 44

Site 4: Site has favourable characteristics



4.3.1 Expansion of the lagoon at the current location

Expansion of the existing lagoon to the west was determined by the proponent not to be a viable option because of the adjacent road and because residences were within the 300-m buffer zone (Figure 3). Questioning by the Panel and on-site reconnaissance by the Panel revealed that the closest residence on the land immediately to the west of the current lagoon was, in fact, a mobile home sited next to an old weathered homestead that appeared to have been abandoned many years ago. The mobile home does not appear to be old enough to predate the construction of the current lagoon. The representative of the RM of Brokenhead was questioned regarding this mobile home, its status as a permanent residence, and why the Rural Municipality had allowed that site to be occupied as a residence, since it appeared that the mobile home was not as old as the lagoon. It was the municipality's interpretation that occupancy of that site was not in contravention of the licence for the current Tyndall wastewater treatment lagoon and that the mobile home constituted a residence. However, the siting of this residence appears to be in contravention of the 300-m buffer zone guideline. Notwithstanding, the municipality clearly failed to take note of the guideline in allowing the movable residence within the 300-m buffer zone.

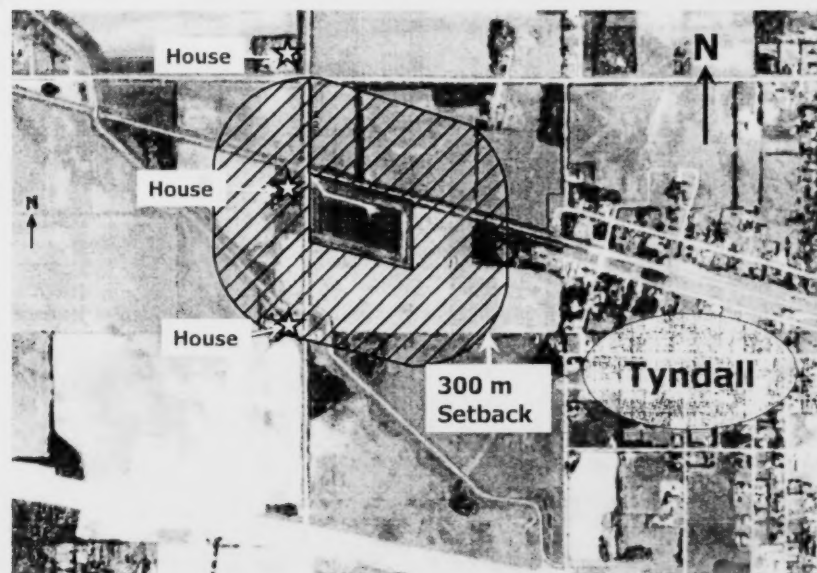
The southernmost house indicated in Figure 3 is shown on the map as being within the 300-m buffer zone.²⁵ Upon visiting the site, the Commission determined that this residence is in fact beyond the 300-m buffer zone.

²⁵ The 1985 objectives state that the distance between the lagoon and the individual residence (originally 1000 feet and now 300 m, i.e., 4.8 m less) should "be measured from the centerline of the nearest dike." The map (Figure 3) shows the buffer zone having been measured from edge of the ditch outside the toe of the dike.

Figure 3 Lagoon Buffer Zone

(Original slide provided by J. R. Cousins – Exhibit #6)

R.M. of Brokenhead Wastewater/ Drinking Water Proposal Wastewater Treatment - Buffer Guidelines



4.3.2 The proponent's proposed lagoon location

The land north of Garson (Section 15, Twp 13, Range 6 East) was identified by J.R. Cousin Consultants Ltd. and confirmed by the Rural Municipality of Brokenhead as the site preferred for the development. The following factors were reported to be important:

land is available at a reasonable price (without expropriation);
there is good road access;
there is good access (Devil's Creek channel right-of-way) for the force-main;
adjacent area (farm land to the east) large enough for future expansion;
it is approximately equidistant from the communities of Garson and Tyndall, with Henryville's sewage to be channelled via the Tyndall forcemain system; and
geotechnical tests show subsoil suitability for lagoon (clay soils).

On the basis of the above factors, the RM of Brokenhead proceeded with the acquisition of the parcel of land at the preferred site. A number of concerns were raised before the hearing about this alternative by both members of the public and the TAC:

- The lagoon at the proposed site is not adequately separated from the channelized Devil's Creek riparian zone.
- The land at the proposed site has been subject to past flooding.
- Proximity to residences, some in the adjacent RM of St. Clements, will cause property devaluation, largely because of odour problems.
- Discharge of digested effluent from the lagoon into Devil's Creek is seen as a source of stream contamination by both nutrients and sediment.
- Increased flows caused by lagoon discharge have the potential to cause stream bank erosion.
- The proposed location of forcemains within the channelized stream riparian zone will impair future habitat rehabilitation and stream restoration.
- Relatively easy availability of land at the proposed site unduly influenced the decision.
- Surface and ground water contamination from the lagoon were raised as concerns during the hearing anticipating possible failures of the lagoon structure to contain effluent.
- Contamination of ground water might occur if the lagoon leaked.
- The existing design at the proposed site barely accommodates a lagoon of sufficient volume. The buffer zone along the east side between the lagoon and the adjacent farm land is larger than the buffer zone between the lagoon and the Devil's Creek channel right-of-way.
- The farm land parcel just east of the proposed site has not been considered because that land was not for sale and the municipality did not wish to pursue expropriation.
- The proposed lagoon site is adjacent to the boundary with the Rural Municipality of St. Clements with which there had been no consultation. The RM of St. Clements

opposes the proposed location of the lagoon. More than one residence in the RM of St. Clements is at or near the minimum distance stated in the setback guideline.

- Floodwaters may inundate the lagoon – no evaluation of this risk was presented.

Concerns were expressed by PFRA with regard to the environmental suitability of the proposed site. These concerns had been forwarded to Manitoba Conservation, and subsequently, to the proponent. The federal representatives present at the hearing stated that the siting concerns had still not been adequately addressed, but they declined to address the substantive issues on which their evaluation had been based, stating that their input was to be purely on process.

4.3.3 Other potential locations for the new sewage lagoon

The proponent presented evidence to show that they had evaluated four possible new locations for the replacement lagoon. Figure 2 shows those sites. It was established at the hearing, however, that the municipality had not given serious consideration to the possibility of expansion of the existing lagoon (new secondary cell) to the west. Nor had they considered the possibility of siting the new lagoon further to the east of the proposed site, largely because that land “was not for sale”. During the hearing, cross-examination by the Panel led to the interpretation that either of these sites was a viable option for the proposed new lagoon.

4.3.3.1 Expansion of the existing lagoon to the west: It was established at the hearing that the existing lagoon could be converted from a two-cell structure to one big primary cell with larger capacity. A new secondary cell could be constructed across the road to the west and connected using suitable piping. This site was originally rejected because it is occupied by a residence within the 300-m buffer zone from the existing lagoon, a mobile home which was allowed to be placed there after the construction of the existing lagoon. The next nearest residences to this site are just over 300 m away to the north and the south. In view of the siting of the current lagoon, the site for this expansion to the west is likely also hydrologically acceptable, but this would, of course, have to be confirmed.

4.3.3.2 The site immediately east of the proposed lagoon site: The land to the east of the proposed lagoon site is further away from Devil's Creek than the proposed lagoon site. It is also further away from the boundary of the RM of St. Clements, and further away from the objecting neighbours. It also presumably has hydrological characteristics similar to those at the proposed site (which would need to be confirmed). Evidence was presented that expropriation might be required.

4.3.4 Commission Comments, Observations and Conclusions

- *The Panel agreed that both sewer and water infrastructure renewal must proceed in a timely manner because of the boil-water advisory in place.*
- *The Panel was disturbed by the limited attention apparently paid by the proponent to the concerns of the adjacent residents, the neighbouring RM of St. Clements, and the TAC and federal review committee.*
- *The Panel was disturbed by the fact that the hearing had been called without adequate responses having been received to the objections raised by the TAC and the federal review committee. The fact that the hearing was called under these circumstances speaks to the limitations of the current TAC review process.*
- *The Panel agreed that the public felt shut out because their input had not been sought during the process on the whole proposal and its alternatives. Public meetings had dealt with the financing aspects of the proposed project only, and little or no opportunity for input had been provided except from those with financial administrative responsibility.*
- *The Panel concurred that the proposed lagoon was sited too close to Devil's Creek. The location of the proposed lagoon was the most prevalent concern voiced at the hearing.*
- *The Panel observed that the neighbouring RM of St. Clements was concerned. It had not been consulted; some of its citizens are affected by the proposed siting of the lagoon.*
- *The Panel observed that flooding information regarding the proposed lagoon site was anecdotal only. No concrete evidence was presented during the hearing to corroborate this concern.*
- *The Panel found that the application, status, and enforcement of the 300-m buffer zone specified in the 1985 guidelines were unclear. The Commission understands that the review of this guideline has been underway since 1985.*
- *The Panel believes that the options (a) and (b) listed below were not given adequate consideration.*

- *Option (a) Existing lagoon site plus land to the immediate west.*
 - *The Panel observed that more consideration should have been given to expansion at the existing lagoon location, which would decrease the impact on Devil's Creek and its riparian zone.*
 - *Since the adjacent residence to the west is a mobile home (temporary structure), the concerns regarding this option appear less persuasive than the view taken by the proponent. The Panel is concerned that a mobile home was permitted to be installed across the road immediately west of lagoon after that lagoon had been commissioned. While the siting of a sewage lagoon within 300 m of a residence is against the 1985 design objectives, there appears to have been no discouragement of the siting of the mobile home well within this same buffer zone after the lagoon had been built.*
 - *The Panel is of the opinion, upon visiting the existing lagoon site that the nearest residences to the north and south (Figure 3) are, in fact, outside the 300-m guideline zone and, therefore, the Panel disagrees with the position that residences near the existing lagoon prevent expansion there.*
 - *Thorough examination of the site appears to show that expansion to the west would be possible.*
- *Option (b) Modification of the proposed lagoon*
 - *The Panel observed that modifications of the preferred site could incorporate adequate buffer zones, if that site is selected.*
 - *The Panel observed that the parcel of land east of preferred site could be used to accommodate a modified lagoon. Expropriation may be necessary.*
- *The Panel agreed that the potential need for expropriation should not stop the RM from proposing, nor Manitoba Conservation from approving, the site which best meets the long term public and environmental health needs of the community. Manitoba Land Management Services, an arms length organization of the Province of Manitoba, exists to assist local governments with the valuation and expropriation processes.*

4.3.5 Commission Recommendations

- It is recommended that a licence be granted for a community sewage treatment system at a site selected from the two alternative locations indicated below:
 - (a) use the existing lagoon site by converting the existing two-cell lagoon to a primary cell and constructing a new secondary cell to the west across the road. Land expropriation may be necessary; or
 - (b) acquire the land east of the site proposed by the proponent to allow the lagoon design to be modified, to allow at least a 30-m buffer zone between the toe of the lagoon dike and the boundary of the Devil's Creek riparian zone, and to allow an adequate setback between the lagoon and the nearby residences [7.2.1].
- It is recommended that, should option (b) be selected, the land required for the lagoon be assembled once the plan is approved. Expropriate if necessary. [7.2.2]
- It is recommended that the forcemain be routed along road allowances rather than in the riparian zone of Devil's Creek, even though Devil's Creek has been extensively channelized. [7.2.3]
- It is recommended that sufficient land be made available to ensure that tertiary treatment can be accommodated in the future for any site that is licensed now. [7.2.4]
- It is recommended that the lagoon infrastructure be planned to include the addition of future tertiary treatment to achieve the objectives required as part of the *Manitoba Nutrient Management Strategy*, *Water Strategy*, *Lake Winnipeg Action Plan*, and the *Principles and Guidelines of Sustainable Development*. [7.2.5].

4.4 Devil's Creek as the Receiving Waters for Treated Effluent

In planning for the new lagoon and the water treatment system, Manitoba Conservation suggested that three chemical parameters were most important regarding the quality of the lagoon discharge water from a regulatory point of view:

- concentrations of ammonia (and aquatic life responses to un-ionized ammonia),
- salt concentration derived from reject water from water treatment plant
- nutrient concentrations (particularly nitrogen and phosphorus)

Discharge to Devil's Creek could also arise from the release of reject water from the proposed reverse osmosis water treatment plant.

4.4.1 Treated sewage effluent

Treated sewage effluent released from the lagoon goes first into Devil's Creek, then into Libau Marsh, on to Netley Marsh, and ultimately to Lake Winnipeg. Effluent from the secondary cell of the proposed lagoon will need to be discharged to Devil's Creek at appropriate intervals (at least twice per year – June and October – under normal conditions).

Concerns raised about the planned discharge of treated effluent into Devil's Creek were addressed by J.R. Cousin Consultants Ltd. who were of the opinion that this discharge would pose no net difference from the current discharge from the currently licensed discharge from the existing lagoon into Devil's Creek. They also pointed out that, because of the design volume of the new lagoon, when at capacity 20 years hence, although the discharge volume would be four times greater, the actual concentrations of nutrients in the discharge effluent released into Devil's Creek would be somewhat lower than is currently experienced. Manitoba Conservation supported this interpretation suggesting that the reduced loading would result from the new lagoon being designed for 230-day storage and treatment (allowing a mid-June release), compared with the current lagoon that was designed for 200-day storage (allowing a mid-May release). Longer digestion in the lagoon would be associated with lowering of the nutrient content, specifically un-ionized ammonia (some of which is lost to evaporation and some through oxidation to nitrate), phosphate (which tends slowly to precipitate), and organic carbon (which is digested, as the weather warms up, by microorganisms to produce carbon dioxide). Nitrate would not likely be lower, however, since some ammonia would be converted into nitrate. Manitoba Conservation further elaborated that because of the increased discharge volume, turbidity might increase slightly, although these impacts could be mitigated. Manitoba Conservation also stated that the additional discharge volume would not cause substantial additional erosion if the discharge rate were appropriately regulated.

The Panel heard a differing opinion from Dr. Eva Pip who was of the opinion that significant scouring would occur; her work over the previous 20-year period, (which she presented to the Panel in a voluntary capacity), showed that the biota in Devil's Creek had decreased consistent with ongoing lowering of light penetration associated with the turbidity of the discharge water.

With regard to effluent discharges from the current lagoon, participants noted that the current lagoon was overloaded and had to be discharged more frequently than the recommended twice a year. The Devil's Creek Watershed Coalition reported that testing done privately after release of sewage in June 2003 indicated that coliform counts were higher than that regulated (although these results were not tabled as exhibits) and that several members residing along side the creek had experienced excessive odour from the discharged effluent. The Devil's Creek Watershed Coalition had also videotaped the commencement of the June 2003 discharge of the existing lagoon and presented it at the hearing showing the turbidity, volume, and hydraulic rush of the discharge water.

J.R. Cousin Consultants Ltd. predicted that, although the total input of ammonia would be greater by year 20, the concentrations would be slightly lower than those present in treated effluent released from the current lagoon, because of the release volume would be five times greater. Manitoba Conservation suggested that downstream concentrations would likely increase slightly. This is due to the fact that discharges for the fall and spring release would normally take place over shorter periods of time (i.e., 2 x 10 days) than the current situation where three releases are practiced. Even so, concentrations of ammonia are not expected to exceed the Manitoba *Water Quality Standards, Objectives and Guidelines* as long as no discharge takes place before mid June. On the other hand, nutrient flux into the Devil's Creek system will increase because more treated effluent will be released. Further, the ammonia concentrations are lowered by evaporative loss and oxidation to nitrate when the release date is June 15 rather than May 15. Nitrate is a form of nitrogen that is not toxic to aquatic fauna. The nitrate (and phosphorus) input, however, promote the growth of aquatic vegetation in the downstream environment of Devil's Creek, Libau Marsh, and ultimately, Lake Winnipeg. Information from Manitoba Conservation provided to the Commission in conjunction with the hearing indicates that "there is some evidence that Lake Winnipeg is accumulating nitrogen and phosphorus (that is, more of these nutrients are being loaded to the lake than flows out through the Nelson River)."

Any additional treatment for removal of nitrogen and phosphorus, i.e., tertiary treatment, would essentially remove the nutrient concern altogether. Such treatment would be necessary to comply with the stated policies and objectives of Manitoba Conservation and the Government of Manitoba (*Nutrient Management Strategy, Lake Winnipeg Action Plan, Manitoba Water Strategy, and the Principles and Guidelines of Sustainable Development*).

4.4.2 Reject water from the water treatment plant

The proposed reverse osmosis (RO) water treatment plant is anticipated to generate 30% reject water.

Salt concentrations could increase slightly in Devil's Creek if the reject water were to be discharged directly to Devil's Creek, depending upon how reject water from the water treatment plant is handled and the treatment technology chosen. Dissolved solids in the reject water would be greater than the ambient dissolved solids concentration in the water in Devil's Creek. (Manitoba Conservation prohibits the discharge of reject water to the creek in the winter as a blanket rule.) Increased salinity would be a concern to irrigators. Water monitoring would be required to determine the downstream sodium adsorption ratio (SAR) which should be less than 6 for irrigation. On the other hand, if reverse osmosis (RO) reject water were to be discharged to the lagoon year round, the salt would be diluted by the sewage system as a whole and any salinity level increases in Devil's Creek from the use of an RO water treatment system would likely be undetectable.

4.4.3 Comments, Observations and Conclusions

- *The Panel observed that the Water Quality Standards, Objectives and Guidelines, although in "draft" form (since 1985), provide guidelines that should be followed.*
- *The Panel noted that the draft Nutrient Management Strategy, and more recent development and management requirements, have been identified by the province as part of the recently announced Manitoba Water Strategy.*
- *The Panel noted that the Lake Winnipeg Action Plan was announced earlier in 2003 to deal with nutrient reductions from both point and non point sources.*
- *The Panel noted that reject water from the proposed RO drinking water treatment facility will be of poorer quality (dissolved solids) than the waters of Devil's Creek.*
- *The lagoon has been sized to include that reject water during the freeze-up period. The Panel agreed that there is little justification for reject water being deposited directly into Devil's Creek during the remainder of the year.*

4.4.4 Commission Recommendations

- It is recommended that the discharge rate to Devil's Creek for treated effluent from the lagoon be adjusted to prevent scouring and erosion. [7.3.1]
- It is recommended that all reject water from the water treatment system, if installed, be routed through the lagoon on a year-round basis. [7.3.2]

4.5 Public Health and the Sewage Treatment System

The sewage system for the RM of Brokenhead is required to protect community health. Public health aspects of the proposed system were identified as follows:

The boil-water advisory must be brought to an end. This requires the dealing with the origin of the contaminants in current domestic water supplies.

The discharge of treated effluent to Devil's Creek has potential public health impacts.

Public health may be at risk if the sewage lagoon is a potential breeding site for the mosquito species *Culex tarsalis*, an identified major vector for the transmission of West Nile virus (Exhibit #s 18 & 38).

4.5.1 Contamination of domestic water supplies – current wastewater practices

Contamination of the domestic water supply was linked directly to the current practice of using septic tanks and septic fields to dispose of wastewater. Leaking (malfunctioning or perforated) holding tanks were also implicated. In both cases, the fractured limestone strata above the aquifers appeared to allow infiltration of contaminated seepage. The Medical Officer of Health has ordered that the water contamination problem be dealt with and has indicated that if the local government does not solve the problem on its own initiative, that the Province will step in at the expense of the individual homeowner and restore each system to safe operation. A centralized sewage system presents an alternative that is more easily regulated and more safely operated than individual systems based on currently used technology. A centralized system that is sized to serve the three communities appears to be the most cost effective approach.

4.5.2 Discharge of treated effluent to Devil's Creek

At the other end of the wastewater system is the treated effluent that must be discharged periodically from the lagoon system. Such water must meet criteria set by Manitoba Conservation for both biological (total coliform and fecal coliform) and chemical (un-ionized ammonia) content. *E. coli* and other pathogens can enter Devil's Creek from the discharged treated effluent but can also be derived from other sources. As well, there are on-going areas of concern do to inappropriate disposal of human waste (spreading "honey bucket" contents on the land was a practice described by at least one rural resident whose land abutted the

Creek) and winter application of animal waste on agricultural land that can be carried by surface melt-water to the creek

4.5.3 Livestock access to Devil's Creek

The Commission noted that some landowners along the creek allowed their livestock direct access to Devil's Creek as a water supply; in fact, the Panel members observed cattle standing in the river downstream of the proposed lagoon site on the first day of the hearing in June 2003. Current regulation (section 2.1 of 326/88 regulation under the Public Health Act) prohibits such access to streams by livestock, but this Regulation appears not to have been enforced at this location.

4.5.4 The West Nile virus and mosquito control

A common vector of West Nile virus in Manitoba is the mosquito, *Culex tarsalis*. It is known to lay its eggs in rafts in quiet permanent standing water. Sewage lagoons and wetlands might provide suitable habitat. The Devil's Creek Watershed Coalition presented information to the effect that the West Nile virus could not be controlled in sewage lagoons with the normal mosquito larvicide protocols. The Manitoba Health entomologist specializing in mosquito control in Manitoba, Dr. Rob Anderson, advised that while control of larvae in such environments is technically possible, control is obtained only after the use of considerably higher concentrations of insecticide than those normally required for the control of mosquito larvae under more usual conditions (and considerably higher than those registered for safe use in aquatic environments). Dr. Anderson stated that in larger expanses of water, wave action would occur and discourage the laying of eggs by *Culex tarsalis* in lagoons. Emergent vegetation, if allowed to grow in sewage lagoons, would reduce the wave action that would discourage mosquito breeding. Manitoba Conservation already requires that sewage lagoons be kept free of emergent vegetation. However, Panel members observed vegetation in the existing lagoon in mid-June, 2003. Removing vegetation is likely to be much more effective in minimizing the risks associated with mosquito-borne disease than treatment of the lagoon with insecticides. The relatively high concentrations of dissolved and particulate organic matter derived from the waste being held in such lagoons would tend to diminish the efficacy of larvicides applied to such waters.

Dr. Anderson recommended that ongoing studies of mosquito control treatment in lagoons should take place and that lagoons in Manitoba should be regularly monitored for the presence of *Culex tarsalis*.

The suitability of marsh and wetlands as habitat for mosquitoes also gave rise to concerns about potential mosquito problems associated with engineered wetlands. No quantitative comparison of the risks associated with the use of engineered wetlands or lagoons as breeding sites for *Culex tarsalis* mosquitoes was presented.

4.5.5 Commission Comments, Observations and Conclusions

- *The Panel noted that the likelihood of contamination of sewage treatment systems such as lagoons and wetlands being attractive to mosquitoes carrying the West Nile virus remains a concern but the difference between lagoons and engineered wetlands in this regard was not quantitatively compared.*
- *The Panel noted that control of emergent vegetation in sewage lagoons already mandated by Manitoba Conservation reduces the likelihood of mosquitoes breeding there.*
- *The Panel noted that the limitations to the use of ground water resources related to inadequate handling of human sewage should be made known in the community so that effective monitoring of any leakage of sewage systems gains general public support.*

4.5.6 Commission Recommendation

- **It is recommended that the licence specify that ongoing mosquito monitoring be required in the sewage lagoons, and that emergent vegetation in the lagoons be controlled, in order to prevent their use as habitat by the mosquito vector of West Nile virus.**

4.6 The Residential End of the System

4.6.1 Residential Issues

A centralized sewage treatment system requires pressurized piping (forcemains) to connect the household system to the lagoon. The current forcemain system services only the southern part of the village of Tyndall. The proposed sewage plan calls for the use of low-pressure service mains to collect domestic sewage from all three communities. The collection system proposed for domestic sewage is a low-pressure forcemain system necessitating the installation of small lift pumps at each residence. In addition, with the proposed system, septic tanks or modified holding tanks will still need to be pumped out on a regular basis (likely annually) and the contents ("solids") hauled to the lagoon. Existing holding tanks that are in good condition can be used with the new low-pressure system. All other systems would need to be decommissioned and replaced with new septic tanks designed specifically for use with the new system.

Cross-examination revealed that property owners would be responsible for the costs of each holding tank, pump, and connection to the low-pressure forcemain. The cost of the centralized collection system is therefore minimized, but the cost to the individual home owner is likely somewhat greater than it would be if a gravity system were installed in the manner usually used in larger centres. A gravity system would also require lift stations, but one lift station would normally serve many households, depending on the topography of the landscape. The Panel was advised by J.R. Cousin Consultants Ltd. that the Garson area is not suitable for a gravity system because of the topography, the shallow bedrock, and the resulting greater capital cost. Qualitative evidence for the presence of bedrock along some routes of the sewer lines was presented, but the installation of a gravity system was dismissed without cost analysis. On the other hand, the possible fracturing of the bedrock during blasting required to install the sewage trunklines and water piping was cited as a factor that might reduce the protection of the upper (admittedly already contaminated) groundwater aquifer from surface water infiltration.

The proposal to construct a new water and sewer system for the communities of Garson, Tyndall and Henryville stems from the fact that many local wells are contaminated and the existing boil water advisory will remain in place until the problems are addressed. The proponent and the residents all agree that the contamination of the water supply is due primarily due to leaking holding tanks, septic tanks, and septic fields. It was further observed that current holding tanks and pump-outs are not being monitored; thus, existing regulations, specifically, Section 2(2) of Manitoba Regulation 326/88R the *Protection of Water Sources Regulation*²⁶ (under the *Manitoba Public Health Act*²⁷) and municipal by-laws are not being enforced. Holding tanks can be subject to leakage through corrosion or intentional perforation.

At the time the new system is installed, the proposed sewage collection system would do away with the septic fields. Holding tanks and septic tanks would be inspected, repaired and replaced if leaking. The Panel is concerned that the holding tanks and septic tanks on each individual property will become new sources of contamination as they spring new leaks over the years of on-going usage. The RM of Brokenhead relies on each individual resident to pay for, and maintain in good working order, the portion of the sewage collection system that is located on his or her property. Past practice has shown that this approach is inadequate and has been the main cause of current water contamination. The Proponent is satisfied the proposed water treatment system will remove any and all contaminants from the water supply. That may offer sufficient assurance to those connected to the new water supply but it offers no comfort to other users within the R.M. of Brokenhead or elsewhere who depend on the same aquifer as the source of their drinking water. As more potential pollution sources are allowed to continue unabated, the greater the problems will grow for larger segments of the population with the risk that the entire aquifer becomes contaminated. The problem may be localized for now but, as a new sewage system is being built, in keeping with the *Lake Winnipeg Action Plan* and the recently announced *Manitoba Water Strategy*, greater concern

²⁶ Protection of Water Sources Regulation: www.canlii.org/mb/regu/crm/20030602/man.reg.326-88r/whole.html

²⁷ Manitoba Public Health Act: www.canlii.org/mb/sta/ccsm/20030602/c.c.s.m.c.p210/

should be devoted to removing individual holding and septic tanks from causing more contamination in years to come. Therefore, the Panel is of the view that a more in depth analysis with regard to the feasibility of implementing a gravity collection system operating with lifting stations if and where needed would significantly eliminate numerous potential existing and additional sources of contamination.

4.6.2 Commission Comments, Observations and Conclusions

- *The Panel noted that the boil-water advisory and the groundwater contamination from malfunctioning wastewater systems continue, causing ongoing disruptions and inconvenience for the residents.*
- *The Panel noted that, while the development and approval processes have been underway, it appears that existing regulations prohibiting groundwater contamination have not been enforced. This lack of enforcement means that the groundwater has continued to be contaminated for the last three years.*
- *The Panel observed that groundwater contamination through infiltration from malfunctioning household systems continues and is likely to continue once the proposed new sewage system becomes operational.*
- *The Panel noted that the overall cost of a gravity sewage collection system had not been fully estimated.*
- *The Panel noted that the proposed system minimizes the up-front municipal tax-load cost but requires significant individual homeowner costs that may be difficult for some households to raise.*
- *The Panel is concerned about the long-term likelihood for continued groundwater contamination. Under the proposed new system, individual holding tanks will continue to be used. As has been demonstrated, these can and will leak, leaving the costs of repair and replacement to be borne by individual homeowners. Neither Manitoba Conservation, nor the municipality has the resources to routinely inspect these tanks to identify sources of groundwater pollution. Therefore, this system is reliant on the goodwill, good citizenship, and environmental stewardship of each individual homeowner.*
- *The Panel is concerned that faced with the high costs of replacement, and/or not fully understanding the consequences to environmental and human health caused by leaking septic tanks, some homeowners may not act in a timely manner to repair leaks as they occur.*

4.6.3 Commission Recommendations

- It is recommended that a gravity sewer system with a small number of lift stations be a given full cost analysis and compared to the proposed system in which individual private holding tanks would be connected to a low-pressure forcemain system with the objective of identifying the system that will effectively handle wastewater at the lowest cost to the individual homeowner. [7.5.1]
- If the RM of Brokenhead proceeds with a low-pressure system, it is recommended that a plan for regular inspections by a responsible authority be initiated to halt groundwater contamination. [7.5.2]

4.7 Water Supply

4.7.1 Ground Water Resources – Availability and Quality Considerations

The availability of a sufficient quantity of groundwater of an appropriate quality is fundamental to the realization of the proposed new water supply system. Detailed consideration of the local hydrogeology would allow this resource to be evaluated. Some members of the TAC recommended that the well site be re-evaluated, since the risk of contamination by infiltration from leaking septic fields and holding tanks is greatest in the vicinity of those systems. The proposed well is in the middle of the smallest of the three communities, Henryville.

The Panel made two attempts to obtain detailed hydrological information from expertise represented at the hearing: from the ground water engineer at the Manitoba Water Services Board, and later, from the hydrologist from the Ground Water Management section of Manitoba Conservation. It was difficult to obtain the information required during cross-examination. However, it was clear from the information provided by Mr. Pedersen of the MWSB that the available quantity of water was not a limiting factor. Evidence presented revealed that there are at least two aquifers, one above the other, and that fracturing of the limestone bedrock and previously drilled wells that have not been properly decommissioned were causes of concern in view of the documented contamination of the upper aquifer from malfunctioning existing individual sewage systems.

Little information was forthcoming from the experts as to the exact location of the recharge area(s) for these aquifers. The direction of flow of the ground water given was vague, being described as the east or the southeast. Information on artesian wells, other wells and sink holes was best provided by local residents. The expert sources were not able to provide confirmation of this information at the hearing although they each believed that the information was available somewhere. Maps of the area were provided by the Water Resources Branch of Manitoba Conservation (now Water Stewardship Department) later without interpretation. An accurate picture of the quality of the water resource was therefore not adequately available at the hearing, although the TAC and the PFRA both had expressed reservations in writing to the TAC about the location of the proposed well. These concerns were untested at the hearing because federal officials provided information only about process and not about substance.

4.7.2 Choice of the Proposed Well Site

Little effort appeared to have been made to locate a well site that would provide high quality water. Rather, it appeared that the well location in Henryville had been chosen on the basis of adequate water quantity and its proximity to all three residential communities combined with the fact that the overburden at that site was relatively thick and that it would provide some protection of the water source from surface water contamination for a number of years. To be sure that a reliable high quality source of domestic water resulted, a sophisticated treatment system for water based on reverse osmosis (RO) was mandated in the proposal.

However, the technical consultant to the Commission for this hearing confirmed that it is unusual to use such a system unless the water source is highly contaminated or is saline. Expert information from the TAC and PFRA predicted that the location of the proposed well so near to the residential areas, rather than up-slope in the aquifer, would lead to localized drawdown that might tend to draw any available contaminated water toward the new well. Although specific alternative locations were not defined as such, it was implied that a well site up-slope from the communities involved would lessen the likelihood of such contamination occurring.

4.7.3 Treatment Technology for Drinking Water Supply

The proposed water supply system includes the installation of a reverse osmosis (RO) system to ensure that the domestic water supply is safe, no matter what contamination takes place. Currently, there is no evidence of contamination of the lower aquifer (identified as the most suitable for the new well to tap into). There have been concerns expressed as to the potential for contamination through infiltration from septic fields and leaking sewage holding tanks; however, it has also been stated that if these sources were removed (and the new centralized sewage system should be designed to do this), then the current contamination, visible in some places in the upper aquifer only, will remediate itself through natural processes. Contamination from this source will be of two forms, microbiological (self-remediates in weeks to months) and chemical nutrient (self-remediates in months to years – the main concern here is nitrate which can pose a public health problem, especially for babies).

Contamination of groundwater with nitrate is a risk facing this water resource when recharge of the aquifer entrains nitrate from agricultural soil nutrient inputs, from animal manure disposal, or from human waste disposal. In general, groundwater sources in Manitoba are and must continue to be monitored to ensure that nitrate levels remain safe.

It is unusual to install an RO system for domestic supply for a community unless the source is highly contaminated or is saline. Other types of water treatment might be considered, but no evaluation of other types was presented to the Panel.

The proponent's plan also includes disinfection by chlorination after the reverse osmosis treatment. Chlorine is currently used to treat most Canadian drinking water systems to remove bacterial and other contaminants. The Panel heard evidence that, unlike treatment with ozone and ultra violet radiation, treatment with chlorine causes a residual amount of disinfectant to remain in the drinking water after it leaves the treatment plant. This is important to prevent infection as the result of contamination in the water system from the time it leaves the treatment plant to the time it is consumed. However, chlorine used to disinfect drinking water reacts with naturally occurring organic matter in water to form trihalomethanes and other chlorinated disinfection by-products (CDBPs).

In 1993, the Federal-Provincial Subcommittee on Drinking Water established a Canadian drinking water standard for THMs (100 parts per billion) based on laboratory animal studies showing a risk of cancer from one of these compounds (chloroform). The Panel heard evidence from the Proponent that the proposed water treatment system would meet this standard and that it was their goal to meet the U.S. standard of 80 parts per billion.

Studies conducted since 1993, including a Great Lakes Basin cancer study sponsored by Health Canada, have raised concerns that the THMs guideline may not be sufficiently protective against risks of cancer and other health effects. Health Canada has established a CDBP Task Group to comprehensively assess the risks from THMs in Canadian drinking water supplies and to make recommendations for changes to Canadian drinking water guidelines. The Panel learned after the close of the Hearings that Manitoba Conservation is represented on this Task Group and that its recommendations for a change in the Guidelines to lower the maximum allowable exposure to THMs is expected shortly. Based on the work of this task group, and on evidence presented at the hearing that trihalomethanes can contribute to the destruction of the earth's ozone layer, this Panel is concerned about designing and implementing a new water treatment system which will create additional human exposures to THMs.

4.7.4 Commission Comments, Observations, Conclusions

- *The Panel noted that water quantity was not a limiting factor; however this had not been proven by the proponent or the MWSB.*
- *The Panel noted that water quality appeared to be suspect in the upper aquifer only, and that contamination appeared to be derived principally from septic disposal systems.*
- *The Panel noted that the extent of the contamination of the upper aquifer had not been properly defined, but that the aquifer had the capability for microbiological self-remediation if contamination ceased.*
- *The Panel requested a proper description of the water resource at the hearing, but it was not provided by the government departments present. Maps relating to the bedrock structure and the location of the aquifers were provided later without interpretation. The adequacy of the supplied maps to address the issues raised at the hearing could not be judged.*
- *The Panel noted that the proposed well at the Henryville location is subject to increased risk of contamination because the drawdown cone at the well site would likely draw any nearby contaminated water toward the new well.*
- *The Panel observed that water treatment would likely be simpler and less costly if the water source were less likely to become contaminated in the first place.*
- *The Panel noted that other sites need to be explored and their life-cycle costs evaluated (rather than just their capital cost) since cost may influence the treatment option chosen.*
- *The Panel noted that a more suitable location for the well is likely to be south of the developed area and up-slope in the aquifer to the southeast or east of the proposed site.*
- *The Panel noted that the RO reject water and its impact on the quality of the water in Devil's Creek remain at issue.*
- *The Panel noted that, since the groundwater contamination problem is due to individual septic systems and holding tanks that need to be replaced, and since the Panel has been advised that this sort of biological groundwater contamination does correct itself within a defined time, it appears worthwhile to try to optimize the source of good quality water and spend less money on the installation and maintenance of a sophisticated water treatment plant. At the same time, correction of the sources of contamination needs to take place, something that is mandated by current regulation*

- *The Panel noted that it appeared from the evidence presented that an alternative source of water might well exist within a short distance of the communities involved and that water from such a system could be expected to remain acceptable as a raw water source over the project lifespan of 20 years, thus obviating the installation of the RO system. An analysis of life-cycle costs of these alternatives would indicate which alternative would be the preferred one.*
- *The Panel noted that a less technically complicated treatment system would require much less upkeep and maintenance than a sophisticated reverse osmosis treatment system.*
- *The Panel observed that it is unusual to install an RO system for domestic supply for a community unless the source is highly contaminated or saline.*
- *The Panel noted that Health Canada has established an expert Chlorinated Disinfection By-Products Task Group to review the current Canadian standard for trihalomethanes in drinking water. Reasonable public policy would act to protect public health both by removing bacterial contamination of drinking water and by minimizing exposure to trihalomethanes, which have been linked to cancer.*

4.7.5 Commission Recommendations

- **It is recommended that the proposed well location be licensed only after alternative locations and alternative treatment scenarios have been adequately evaluated and if these are subsequently rejected. [7.6.1]**
- **It is recommended that alternative well sites be evaluated to the southeast and east of Henryville with the intent of finding a source that will provide water of sufficient quality for 20 years without resorting to the use of expensive membrane technology. [7.6.2]**
- **It is recommended that life-cycle costs of proposed well sites and water treatment procedures be evaluated rather than capital costs alone. [7.6.3]**
- **It is recommended that the capability of the upper aquifer underlying the RM of Brokenhead to self-remediate be quantified in such a manner that the safety of using the water from the lower aquifer as a source of domestic water for a 20-year period can be estimated. [7.6.4]**
- **It is recommended that water treatment technologies other than reverse osmosis be considered as being more suitable if the well is sited to optimize 20-year water quality. [7.6.5]**

- It is recommended that the water treatment system to be installed meet the revised recommendations of the Federal/Provincial Chlorinated Disinfection By-Products Task Group, expected to be released later in 2003. Since Manitoba Conservation (now Water Stewardship) is represented on this task group, it should be unnecessary to await formal release of the revised recommendations. [7.6.6]

4.8 Environmental Impact Statement Deficiencies

4.8.1 Issues Related to the Environmental Impact Statement

Several outstanding issues were identified that had not been satisfactorily addressed before the hearing was called. The most significant of the issues included the following:

the lagoon location relative to Devil's Creek and nearby residences;
the lagoon and water treatment plant discharges to Devil's Creek and their potential impacts on fish and wildlife habitats in the receiving water course, the water quality (e.g., for irrigation), and water uses such as recreation and other uses;
the proposed location of the forcemain within the riparian areas of Devil's Creek;
potential for contamination of proposed well at the proposed site.

These issues were clearly identified in writing by the TAC and the federal advisory group well in advance of the hearing. It was clear that the proponent had not addressed the concerns of the TAC and federal advisory group regarding these deficiencies adequately before the hearing was called. It was also clear that the provincial and federal officials who appeared before the Panel were reluctant to discuss technical matters of substance justifying their positions, and, in some cases, that they were ill-prepared to do so. It was also clear that almost all of the objections arising from the intervenors had to do with these unresolved issues. The concerned residents appeared to believe that the unresolved issues would have remained that way if they had the Minister not referred these matters to the Commission.

The Panel was fortunate that historical data on Devil's Creek biota were provided by volunteer scientific expertise. The Panel believes that it is important to understand the biological system which is proposed to receive the treated effluent in order to fully understand the environmental impact of the proposed development. Part of that information includes the nutrient status of the receiving waters with the changes over the open water months shown. The Panel was concerned that although the Province released its *Lake Winnipeg Action Plan*, early in 2003, no mention was made nor consideration given to the impact the proposed system might have on Lake Winnipeg. Neither was any mention made of the cumulative effects of ongoing disposal of treated sewage effluent into the receiving waters such as Devil's Creek, Libau Marsh, and Lake Winnipeg. If the effects are minimal, then this should have been stated and justification provided. The Panel believes that for the *Manitoba Nutrient Management Strategy*, *Manitoba Water Strategy*, *Lake Winnipeg Action*

Plan, and The Principles and Guidelines of Sustainable Development to have any effect, Manitoba Conservation must require that proposed developments be planned taking these into consideration.

Details and maps of the hydrogeology of the RM of Brokenhead were not available from the MWSB and were described generally only. The fact that domestic water contamination had occurred was a matter of record from the Medical Officer of Health (boil-water advisories) but little detailed information as to the mechanism for this contamination or its remediation were provided. Nutrient contamination of the ground water was described generally, but sufficient detail was not provided to allow the Panel to adequately address the issue of specific well location. Health considerations were dismissed as selection criteria for location of the well by proposing use of a sophisticated water treatment technology that normally would not be necessary. Requests for detailed information on ground water recharge were not satisfied at the hearing. Maps provided later (without the opportunity for cross-examination) showed that the resource had been well mapped and the requested information could have been made available to the public at the hearing.

4.8.2 Commission Comments, Observations and Conclusions

- *The Panel noted that a number of the responses requested from the proponent to the concerns of the TAC and federal review committee had not been received at the time of the hearing.*
- *The Panel observed that some government representatives appeared to have come to the hearing ill-prepared to participate effectively. Facts were not immediately available, documents and maps were not at hand, membership on committees and advisory groups could not be recalled, and hard technical information was not available for discussion. Only the proponent, the funded intervenor group (i.e., the Devil's Creek Watershed Coalition), and several other intervenors came prepared to discuss hard data.*
- *If the Commission is to do its job properly, it needs to be able to have the required information available at the hearing.*
- *The Panel noted that one of the significant deficiencies identified by federal representatives and by Manitoba Conservation was the proposal to install sewer trunk lines within the riparian zone of Devil's Creek. This deficiency was not adequately addressed by the proponent.*

4.9 Other Issues

4.9.1 The cost per household

A system that relies on the compliance of hundreds of individual homeowners is more likely to fail than a municipally operated one. A centralized system can be constructed in such a way that the centralized cost is minimized, or it can minimize the cost to the individual homeowner.

The costs per household of the installation (approximately \$5,000) of the proposed sewage system may not be fairly apportioned within the community. Increasing the portion of the system that is public and reducing the portion that is directly payable by the individual household will likely reduce the overall cost per household. Further, the higher centralized costs are likely to be eligible for support from agencies such as the Manitoba Water Services Board. A system that uses gravity feed of sewage to community lift stations would do this more effectively than a plan that puts a mini-lift-station on each property. At the same time, there is concern that cutting into the bedrock or hardpan during installation of the sewer forcemains and domestic water supply may cause fracturing of the bedrock allowing infiltration of surface and septic field seepage into the aquifer below. This upper aquifer is, however, the aquifer that is currently subject to contamination from the malfunctioning septic fields and holding tanks.

4.9.2 Other sewage/septage and access control to the new lagoon

The existing Tyndall lagoon cannot accommodate the sewage currently being fed into it. This sewage includes effluents delivered via the existing low-pressure forcemain from south Tyndall plus the septage hauled in from the rest of Tyndall, Garson, and Henryville. Further input, currently unquantified, comes from other nearby rural areas. Because this extent of this rural input is not known, it is not clear if the new system will be able to handle it. Evidence presented at the hearing showed that, while there were only three septic hauling companies licensed to dump sewage and septage into the lagoon, there is currently no other control over access to the existing lagoon. There appears to be no provision in the proposal for access control at the new lagoon, either.

4.9.3 Monitoring of receiving waters

Monitoring of the nutrient status of lagoon contents is required by law before release to receiving waters is allowed. There is no monitoring being carried out on the receiving waters themselves in such a manner that impacts can be determined. The regulatory system relies largely on modelling of the receiving water impact and calculation of nutrient concentrations. Monitoring of the biota in the receiving waters is also not adequate to determine whether the government policies mentioned above are being acted upon.

4.9.4 Downstream uses

Downstream uses of the receiving waters include uses as habitat for biota, use as a source of irrigation water, and recreational use. Monitoring of water chemistry is necessary to ensure that the receiving waters can safely be used for irrigation. High nutrient loads will encourage algal and emergent vegetation growth, impeding passage of watercraft such as canoes and kayaks. High bacterial levels will affect the use of the receiving waters for swimming, wading, and livestock watering.

4.9.5 Monitoring of groundwater quality

Ongoing monitoring of ground water quality will be required to ensure the safety of the resource for use for domestic water following minimal treatment. The safety of any treatment protocol also needs to be monitored by regular testing of the treated water supply for bacterial contamination and nutrients. It was suggested by one technical respondent that the location of the proposed well would cause drawdown which would pull in contaminants from any nearby source. While the groundwater geologist from the MWSB was of the opinion that no such risk existed, he also stated that the RO treatment proposed would remove any contaminants.

4.9.6 Nutrient input to Lake Winnipeg

As work proceeds on the *Lake Winnipeg Action Plan*, notice will have to be taken of sources of contamination and nutrients associated with stream and river input to Lake Winnipeg. While the expected nutrient input from the proposed sewage treatment system for the RM of Brokenhead to the Lake Winnipeg system is arguably small, work to reduce nutrient inputs to this system have to start somewhere. Each opportunity to do so that is ignored is an indication that the objectives and policies already adopted by the government of Manitoba are not being administratively respected.

4.9.7 Environmental concerns

Those concerned residents who live outside the areas served by the new system fear odours from the new lagoon, potential ground water contamination, potential harm from the discharged effluent in Devil's Creek to children, irrigated crops, and the fishery downstream in and near Lake Winnipeg. They are also concerned about the use of high-value farmland for the new lagoon, the potential of the new lagoon to cause flooding or to be inundated by floodwaters, and the lowering of property values for those residences most affected by the new lagoon.

The proponent appeared to have responded to each objection and suggestion, but the responses too often simply restated or repeated the content of the EAP rather than adding more explanation and substantive information to allay the concerns, fears, and objections of the residents and the technical reviewers.

4.9.8 Commission Comments, Observations and Conclusions

- *The Panel noted that the sustainable development policies adopted by the Government of Manitoba some years ago would minimize, if not eliminate, the concerns raised in this section.*

5. Sustainability

Among the stipulations for the CEC hearing was that the recommendations were to incorporate, consider, and directly reflect, where appropriate, the *Principles of Sustainable Development and Guidelines for Sustainable Development* as contained in the *Sustainable Development Strategy for Manitoba*.²⁹

In 1990, the Manitoba Round Table on the Environment and Economy released the core document entitled *Towards a Sustainable Development Strategy for Manitobans* outlining proposed principles and guidelines for sustainable development and proposed component strategies that would help to guide all facets and activities in our daily lives. Following an extensive consultation process, the revised document was released in 1996 and it was mandated that all activities of government departments in Manitoba would operate under these principles and guidelines. Movement toward this objective has been slow, but the Clean Environment Commission has been given the task of reporting on how a proposed development will promote these principles and guidelines. A list of sustainability indicators has not yet been agreed upon nor has it been provided to the Commission. Consistent with the direction from the Minister that it incorporate, consider, and directly reflect, where appropriate, the *Principles of Sustainable Development and Guidelines for Sustainable Development* as contained in the *Sustainable Development Strategy for Manitoba* in its recommendations, the Commission report examines the proposed project and the recommendations in the light of these principles and guidelines.

5.1 Principles of Sustainable Development

There are seven *Principles of Sustainable Development* listed by the Environmental Stewardship Division of Manitoba Conservation:

- integration of environmental and economic decisions
- stewardship
- shared responsibility and understanding
- prevention
- conservation and enhancement
- rehabilitation and reclamation
- global responsibility

(Detailed elaboration on each Principle is contained in the complete document.)

The economic decision to be made is one of selection of the technology to be used to provide the needed water supply and wastewater treatment for the RM of Brokenhead. Given choices, the least expensive alternative that meets the requirements is likely to be chosen.

²⁹Sustainable Development Strategy for Manitoba,
www.gov.mb.ca/conservation/susresmb/pub/strategy/index.html

The environmental and health initiatives are what are driving this proposal. The health aspects of safe water supply and the environmental acceptability and public health aspects of responsible treatment of wastewater are at the centre of the issues that have been considered. In order that the least expensive alternative can be chosen appropriately, it will be necessary that full cost accounting and life-cycle costs have been determined. To do otherwise will bias the choice and reduce the likelihood of a solution that conforms to the Principles and Guidelines of Sustainable Development.

5.1.2 Stewardship

Future generations are being considered since the EAP addresses the need to protect public health and the environment. Perhaps the major shortcoming as far as stewardship is concerned is that the timeframe for the proposed project is only 20 years. While this timeframe is chosen for practical engineering purposes, stewardship presumably extends also to concern for long-term nutrient input to Lake Winnipeg (see 4.9.6 above).

5.1.3 Shared responsibility and understanding

In a spirit of partnership and cooperation, the RM of Brokenhead, Manitoba Environment, the Clean Environment Commission, and the citizens of the three communities seeking an upgrade of their water and wastewater system are working toward a common goal. Accountability to the laws of Manitoba and Canada is built into the proposal; it is important that this accountability be ensured by effective and transparent enforcement. The economic and social views, values, traditions and aspirations of the citizens of the RM of Brokenhead living in the three communities are similar to those of the rest of Manitoban society; however, these citizens are perhaps closer to the realities of the environmental effects of water and wastewater systems that are not compatible with sustainable development. The need to protect the environment within a healthy society and economy means that the established policies and objectives of the government of Manitoba (*Manitoba Nutrient Management Strategy, Manitoba Water Strategy, Lake Winnipeg Action Plan, and the Objectives, Guidelines, and Standards for Water Quality*) need to be followed and respected in the issuance of a licence to the RM of Brokenhead.

5.1.4 Prevention

The proposal deals with the water supply issue and the location of the proposed well from a public health point of view by mandating "high-tech" treatment of the water by reverse osmosis, rather than by preventing contamination at source. The application of this sophisticated technology to the whole domestic water supply means that, given ongoing maintenance of the RO system, a sustainable high quality water supply is assured and public health is protected. The lifetime perspective of the proposed system is, however, 20 years.

5.1.5 Conservation and enhancement

Maintenance of ecological processes, biological diversity, and the life-support systems of the environment is behind the requirements for responsible disposal of wastewater from the proposed water/wastewater system. To meet the stated objectives and policies of the government of Manitoba, tertiary treatment of the wastewater is required; however, it is not yet mandated by Manitoba Conservation in practice. It should be. The long-term capacity of the natural ecosystem to handle nutrient input will be harmed if tertiary treatment continues to be ignored as is currently the practice.

5.1.6 Rehabilitation and reclamation

The rehabilitation of damage to and degradation of the environment downstream of the three communities on Devil's Creek depends on the care with which water is released into Devil's Creek. Water *quantity* in the creek can be controlled by the rate of release when the lagoon is emptied. Nutrient flux to the system can be controlled to a small extent by careful use of the lagoon technology; however, full nutrient management requires tertiary treatment. Otherwise, release of nitrogen and phosphorus to the receiving waters will contribute to the ultimate degradation of Devil's Creek and the downstream waters of Libau Marsh and Lake Winnipeg. Reclamation of these ecosystems once they are degraded is much more challenging than protecting them in the first place.

5.1.7 Global responsibility

Waters from the proposed project drain to Lake Winnipeg, Hudson Bay, and the Atlantic Ocean. The initiatives taken to develop comprehensive and equitable solutions consistent with the stated objectives and policies of the government of Manitoba will gain national and international respect.

5.1.8 Commission Comments, Observations and Conclusions

- *The Panel agreed that it will be necessary that full cost accounting and life-cycle costs are determined in order that the least expensive alternative can be chosen appropriately. To do otherwise will bias the choice and reduce the likelihood of a solution that conforms to the Principles of Sustainable Development.*
- *The Panel noted that a 20-year time frame for the design of the project, while administratively convenient, is somewhat shortsighted when stewardship is considered.*
- *The Panel observed that the need to protect the environment within a healthy society and economy requires that the established policies and objectives of the government of Manitoba (Manitoba Nutrient Management Strategy, Manitoba Water Strategy, Lake Winnipeg Action Plan, and the Objectives, Guidelines, and Standards for Water*

Quality) be followed and respected in the issuance of a licence to the RM of Brokenhead.

- *The Panel agreed that the installation of an RO water treatment system, given adequate maintenance, would provide the RM of Brokenhead with a water supply of sustainable quality consistent with the requirements of a healthy community. Full-cost accounting or life cycle costing of the water source and treatment options will assist arrival at the appropriate decision on this matter.*
- *The Panel noted that tertiary treatment of the wastewater is required to meet the stated objectives and policies of the government of Manitoba; however, it is not yet the practice of Manitoba Conservation to require such treatment. It should be. The long-term capacity of the natural ecosystem to handle nutrient input will be harmed if tertiary treatment continues to be ignored, as is currently the practice.*
- *The Panel noted that reclamation of ecosystems degraded through ignorance of the principles and guidelines of sustainable development is much more challenging than conservation consistent with the Principles of Sustainable Development in the first place.*
- *The Panel observed that the initiatives taken to develop comprehensive and equitable solutions consistent with the stated objectives and policies of the government of Manitoba as noted would gain national and international respect.*

5.2 Guidelines of Sustainable Development

There are six guidelines of sustainable development listed by the Environmental Stewardship Division of Manitoba Conservation:

- Efficient use of resources
 - Public participation
 - Access to information
 - Integrated decision-making and planning
 - Waste minimization and substitution
 - Research and innovation
- (Detailed elaboration on each Guideline is contained in the complete document.)

5.2.1 Efficient use of resources

The resource being utilized in this proposed project is domestic water. The calculations predicting consumption rates for that water are based on common urban practice in which each resident uses approximately 360 L of water per day. Currently, in households where there is a private well and a septic tank or holding tank, water consumption tends to be self-regulating. The fact that rural water usages are typically a fraction of this level was confirmed by evidence given by a rural resident. A representative of Manitoba Conservation stated that although his department supported water conservation, it was not being proactive in promoting domestic water conservation.

The installation of the new community well is designed to facilitate increased consumption of treated water to an estimated 360 litres per day per person. While this consumption level is consistent with that present in cities such as Winnipeg, it does nothing to build on current restrained usage levels in the community that are much closer to those that are sustainable, considering that unlimited quantities of clean water are not available. Current practice of both the Manitoba Water Services Board and the regulatory arm of Manitoba Conservation is to simply cater to historical urban consumption rates. Efficient use of resources would dictate that regulatory action be taken to encourage conservation by limiting supply and encouraging those already accustomed to water stewardship to continue the practice and show the way to others. Standard-of-living need not be compromised in doing so. For example, a major portion of domestic water usage is for sanitation and laundry. Low-volume flush (typically 6-L per flush, although some models use as little as 4 L) toilets, available for many years, enable households to maintain their standard of living while reducing their sanitary-need water use by up to 60-75%, since older model toilets use as much as 20 L per flush. Similarly, reducing the flow of water in the showerhead can reduce water usage by 50%. Such water conservation measures are being promoted by Manitoba Conservation and the City of Winnipeg already. If the use of such water-saving measures is not built into the licensing of new systems, then they will take much longer to become established, perhaps longer than we can afford, considering the effects of global warming.

5.2.2 Public participation

The Environment Act Proposal process was designed to encourage public participation. As has been noted earlier in this report, the process partially failed in the case of this proposal. Forums that "encourage and provide opportunity for consultation and meaningful participation in decision-making processes" evidently were not held, or if held were not effective in soliciting input. The process appears not to have been followed, partially through inadvertent focussing on the money required for the project, and partially through ignorance of what was required to involve the citizens of the municipality. There appears to have been little or no "striving to achieve consensus amongst citizens with regard to decisions affecting them."

5.2.3 Access to information

The Environment Act Proposal process is set up to provide access to information. As has been noted earlier in this report, the process evidently did not serve the citizens of the RM of Brokenhead well in the case of this proposal. While the economic aspects of pushing the proposal ahead were addressed by the municipality and the MWSB, there was little if any awareness of the responsibility to "encourage and facilitate the improvement and refinement of economic, environmental, human health and social information" as a package; neither do there appear to have been "opportunities for equal and timely access to information" by all affected citizens of the RM of Brokenhead.³⁰

5.2.4 Integrated decision-making and planning

While there was joint scrutiny of the proposal by officials of the governments of Manitoba and Canada, this process tended to be stiff and invisible to many concerned citizens. Further, it was clear that the proponent, as represented by J. R. Cousin Consultants Ltd., had inadequately addressed the concerns to the satisfaction of these regulatory reviewers. Insufficient attempts were made to integrate the citizens of the municipality into the review process prior to the Commission's involvement.

5.2.5 Waste minimization and substitution

The generation of human sanitary waste itself is not something that can easily be minimized; however, the way in which it is handled can determine the quantity of liquefied waste that must be treated. Further, the extent to which wastewater is treated dictates the extent to which the resulting effluent is compatible with the environment, e.g., the receiving waters. The objectives and policy documents of the government of Manitoba (see earlier discussion) direct that this effluent needs to be treated to remove nutrients, as well as microbiological contaminants and chemical contaminants directly toxic to aquatic biota, before its release. The designed system in the proposal does not address this need.

5.2.6 Research and innovation

The needs of the RM of Brokenhead in installing a new integrated water and wastewater system provide an opportunity for new technology to be demonstrated. Wastewater treatment utilizing constructed (engineered) wetlands, for instance, could quite easily be demonstrated.

³⁰ Quotes are taken from the Guidelines of Sustainable Development, elaboration on 3. Access to Information.

5.3 Commission Comments, Observations and Conclusions

- *The Panel noted that the installation of the new community well is designed to facilitate increased consumption of treated water to an estimated 360 litres per day per person. While this consumption level is consistent with that present in cities such as Winnipeg, it does nothing to build on current restrained usage levels in the community that are much closer to those that are sustainable, considering that unlimited quantities of clean water are not available.*
- *The Panel observed that current practice of both the Manitoba Water Services Board and the regulatory arm of Manitoba Conservation is to simply cater to historical urban consumption rates, rather than encouraging continued water conservation as currently practiced in rural areas reliant on individual water/wastewater systems. Standard-of-living need not be compromised in doing so. For example, a major portion of domestic water usage is for sanitation and laundry. Low-volume flush (typically 6-L per flush, although some models use as little as 4 L) toilets, available for many years, enable households to maintain their standard of living while reducing their sanitary-need water use by up to 60-75%, since older model toilets use as much as 20 L per flush. Similarly, reducing the flow of water in the showerhead can reduce water usage by 50%.*
- *The Panel noted that such water conservation measures are being publicly promoted by Manitoba Conservation and the City of Winnipeg already. If the use of proven water conservation measures are not built into the licensing of new systems, then they will take much longer to become established, perhaps longer than we can afford, considering the effects of global warming.*
- *The Panel noted that forums that "encourage and provide opportunity for consultation and meaningful participation in decision-making processes" evidently had not been held, or if held, had not been effective in soliciting input. The process appears not to have been followed, partially through inadvertent focussing on the money required for the project, and partially through ignorance of what was required to involve the citizens of the municipality. There appears to have been little or no "striving to achieve consensus amongst citizens with regard to decisions affecting them" as required in the Guidelines of Sustainable Development.*
- *The Panel noted that while the economic aspects of pushing the proposal ahead were addressed by the municipality and the MWSB, there was little if any awareness of the responsibility to "encourage and facilitate the improvement and refinement of economic, environmental, human health and social information" as a package; neither do there appear to have been "opportunities for equal and timely access to information" by all affected citizens of the RM of Brokenhead (nor affected citizens of the adjacent RM of St. Clements).*

- *The Panel observed that the Environment Assessment process tended to be stiff and invisible to many concerned citizens. Further, it was clear that the proponent, as represented by J.R. Cousin Consultants Ltd., had inadequately addressed the concerns to the satisfaction of these regulatory reviewers. The public appears not to have been integrated into the decision-making process until the Commission became involved.*
- *The Panel noted that the designed wastewater system does not address the need to remove nutrients from the wastewater to be compatible with sustainable development.*
- *The Panel believes that there are several waste minimization opportunities that might be taken within this project in conjunction with the promotion of sustainable development. New sewage systems tend to remove the limits from the quantity of water used in everyday life, and they are commonly sized to accommodate water use at urban rates without consideration for conservation of the resource (see above). To be compatible with the Principles and Guidelines for Sustainable Development, the licence for the new community system could promote water conservation by encouraging the retrofitting of low-volume flush toilets, efficient front-loading washing machines, and the reuse of gray-water for irrigation in the growing season. Further, the payment rates for water consumption could be put onto a sliding scale to encourage water conservation. If these opportunities are not taken, it is doubtful that it will be possible to associate the installation of the new water/sewage system with the Principles and Guidelines for Sustainable Development.*
- *It is the Panel's view that Manitoba Conservation (Approvals Branch) and the MWSB did not view part of their job to be the promotion of the provincial sustainable development policies. Yet unless these policies are acted upon, proponents will not incorporate them into their planning and opportunities for funding demonstration projects will be lost. This development would have been a wonderful opportunity to do just that. Without such integrated support and encouragement, old ways with their well-identified environmental shortcomings will continue and progress toward sustainable development will be hampered.*

5.4 Commission Recommendations

- **It is recommended that sewage/septage treatment in the new system incorporate nutrient removal to restore the water to the quality compatible with the receiving waters of Devil's Creek. [7.7.1]**
- **It is recommended that licensed capacity of the new wastewater system for the RM of Brokenhead be designed to incorporate measures to encourage water conservation, such as, designed size being linked to that needed if low-volume toilets and restrained water use are in place. [7.7.2]**

6. Observations and Advice to the Minister

During the Hearing several issues arose which, while not included as recommendations, were important enough in the opinion of the Panel, to be presented as observations and advice to the Minister. They are:

1. enforcement of existing regulations against groundwater contamination
2. the *Environment Act* approvals process
3. federal government participation in the hearing
4. provincial government participation in the hearing
5. community participation in the hearing
6. sewage treatment issues
7. sustainable development

6.1 Enforcement of Existing Legislation and Regulations

The Panel notes that, while the development and approval processes have been underway, it appears that existing regulations prohibiting groundwater contamination have not been enforced. This lack of enforcement means that the groundwater has continued to be contaminated for the last three years.

It is the opinion of the Panel that the RM of Brokenhead, the LUD of Tyndall/Garson and all of the individual property owners and residents each and together have ongoing responsibilities to halt the continuing pollution from human and farm animal waste of their ground water resource. Furthermore, the Panel believes that the application by the RM of Brokenhead for approval of a new water/wastewater system does not reduce the continuing obligation of provincial authorities, notably Manitoba Conservation, to enforce existing relevant legislation and regulations. This opinion is supported both by the *Environment Act* and the *Public Health Act*.

Contamination of the water supply by sewage is specifically prohibited in Section 2(2) of Manitoba Regulation 326/88R the *Protection of Water Sources Regulation* under the *Public Health Act*. This Regulation states:

2(2) No person shall commit any act that will or may contaminate any underground water supply by the discharge of any sewage, surface drainage, liquid waste, or filth into any well, abandoned well, hole, or other opening, and no person shall fill or replenish any existing well, except with water from an approved source satisfactory to the medical officer of health.

The Regulation further states

Order to desist and clean up

4(1) Where any accumulation of manure, filth, or refuse is found on the banks of, on the ice of, or in close proximity to, any water course, or any act is being committed that, in the opinion of the medical officer of health or inspector, causes contamination or pollution, or creates a nuisance or offence, or affects injuriously any public or private water supply, the medical officer of health, the inspector, or the Minister shall forthwith order the person responsible for the accumulation of any such material or the commission of any such act to desist from any such practice and to clean up and remove all such material.

The existence of the boil-water advisories is evidence that the contamination of the drinking water in the communities of Garson, Tyndall, and Henryville "affect injuriously a public or private water supply."

The Panel notes that while the Regulation calls upon the Minister to "forthwith order the person responsible to desist from any such practice and to clean up and remove all such material," no action has been taken since the identification of the problem in July 2000.

The *Environment Act* also contains provisions to allow the Province to intervene to stop such groundwater pollution where "a situation exists that does or is likely to result in unsafe conditions." The Panel believes that the existence of the Boil Water Advisory is sufficient evidence of an "unsafe condition". The *Act* states:

Emergency action by director

24(4) Where the director has reason to believe that a situation exists that does or is likely to result in unsafe conditions or in irreparable damage to the environment, or upon consultation with a medical officer of health is of the opinion that the existing situation constitutes or is likely to constitute an imminent threat to environmental health, the director shall, in writing, order the person in authority to take such emergency action as the director deems necessary to avert and remedy the situation and to

(a) cease or modify the activity specified in the order for such period of time as may be necessary to rectify the problem; or

(b) clean or repair the area affected; or

(c) restore the environment to a condition satisfactory to the director; or

(d) any or all of those things specified in clauses (a), (b) and (c) within such period of time as the director specifies.

The Panel believes that Manitoba Conservation should have acted under this Section of the *Act* to require that the sources of the drinking water contamination be identified and rectified. The Panel believes that allowing this pollution to continue for three years, since the date of the first boil water advisory, is not in the public interest.

Commission Advice

- **It is the advice of this Panel that regulations to protect groundwater from pollution should be enforced while sewage treatment applications are being prepared and reviewed.**

6.2 The Environment Act Proposal Process

The process leading up to the hearing was a lengthy one. Despite this, when the hearing began, the Proponent had not yet provided answers to key questions of fact posed by members of the TAC about the proposed location of both the lagoon and the well. This led to a number of problems. Firstly, the Hearing process was lengthened because it was left to Panel members to pose these questions. Secondly, because the evidence was not part of the Public Registry documentation prepared in advance of the Hearing, intervenors did not have the opportunity to review this evidence and prepare their questions in advance.

The Panel was disappointed that obvious concerns from members of the review committees had not been addressed during the process before the hearing had been called. As a result, it appeared that the CEC hearing had been viewed as the opportunity for these concerns to be responded to and cleared up. Had the needs of the community been attended to more carefully and in a timely manner, the hearing might have been considerably shorter or might not have been necessary at all.

The Panel believes that Manitoba Conservation should have used its authority to require the proponent to respond to the concerns raised by the TAC members prior to the start of the hearing. The fact that the hearing was called under these circumstances speaks to the limitations of the current TAC review process.

Commission Advice

- **It is the advice of this Panel that Environment Act Proposals should not be referred to the CEC until the TAC has first received, and then reviewed, all of the material that it has requested. If deficiencies remain at the time of referral to the CEC, the Department should identify them and identify the appropriate technical expertise that the Panel may require to address these issues at the pre-hearing stage.**

6.3 Federal Government Participation at the Hearing

When the Hearing began, Panel members expected that representatives of the federal government would appear, both to answer questions and to seek answers from the Proponent to their own questions which remained unanswered at the TAC. However, as described above in Section 4.1.4, this did not occur. Federal representatives declined to answer technical questions, even questions directly arising from their own memoranda which

appeared in the Public Registry. Federal representatives would answer only questions about the application and review processes. Therefore, the Panel and the community members present were left without the benefit of this expertise. Community members were clearly frustrated by this approach and the Panel appreciated the dispassionate approach that the community members took at the Hearing.

The Panel believes that all members of the TAC, and other staff, who have had substantial input into the process, should be prepared to appear at public hearings to answer questions in response to their documentation that appears in the Public Registry.

Commission Advice

- **It is the advice of this Panel that the Minister seek clarification from his federal counterpart as to the role of federal technical experts at CEC Hearings. Should federal technical experts not be prepared to participate fully at future hearings, including responding to technical questions, we request that the Minister advise the CEC so that the Commission might consider alternative ways of ensuring that this evidence is entered into the record and tested in the hearing process. These might include the retention of its own technical experts on these questions and/or the subpoenaing of federal employees.**

6.4 Provincial Government Participation at the Hearing

As described in Section 4.1.4 above, the Provincial government members of the TAC were also not present at the Hearing. This meant that the Panel and community members present did not have the opportunity to question TAC members about their concerns. Nor did Departmental representatives use the Hearing as an opportunity to place on the record those concerns raised by Provincial TAC members which remained unresolved at the beginning of the Hearing. Therefore, the Panel and the community members present were left without the benefit of this expertise. At the same time, since a number of key technical issues had, in the opinion of the TAC, not been appropriately addressed by the proponent, the Panel was left without either the benefit of a complete documentary record, or the opportunity to compensate for this lack with evidence presented at the Hearing.

This Panel believes that it should be able to obtain technical evidentiary information from experts within government departments at the public hearing. In order to address the terms of reference and the issues raised at the hearing, Panel members and the public need to be able to ask questions of Departmental staff about the environmental impact of the proposed development. During the Hearing, Panel members observed that there did not seem to be an appropriate "arms length" relationship between the Proponent and the Department, as regulator. This was evidenced by the unwillingness of Departmental staff to question the Proponent to seek answers to questions which the Department had raised at the TAC. This concerned Panel members, believing that the regulator must maintain enough distance from the Proponent and the project to enable Departmental staff to provide technical evidence to help the Panel in its decision-making process, and equally important, to prevent the appearance of conflicts of interest. These arise where the Department is seen both as the

regulator and as a supporter of the Development. The establishment of the new Department of Water Stewardship (which occurred after the completion of this Hearing), may provide a vehicle toward this end.

Commission Advice

- **It is the advice of this Panel that the Minister should direct that Departmental staff appear at CEC hearings prepared to answer questions about their documentation which appears in the Public Registry and other relevant issues within their area of technical expertise.**
- **Should the Minister choose not to accept this advice, we request that he advise the CEC, so that the Commission might consider alternative ways of ensuring that this evidence is entered into the record and tested in the hearing process.**

6.5 Community Participation in the Review Process and the Hearing

Throughout the Hearing, the Panel heard expressions of frustration from local residents about the process to date. Those who supported the development, including representatives of local government, and those who opposed it, shared frustrations with access to information. Those opposed to the development felt that there had not been any opportunity for their concerns to be heard at public meetings. Local officials felt that they had been left without technical support both when the groundwater contamination was identified, and later, in sorting out which individuals in which government departments they should deal with on issues as they arose.

The siting of the proposed lagoon was the most prevalent concern voiced at the hearing. The Panel observed that the neighbouring RM of St. Clements had not been consulted and some of its citizens are affected by the proposed siting of the lagoon. The Panel was disturbed by the limited attention apparently paid by the Proponent to the concerns of residents of the RM of Brokenhead and of the neighbouring RM of St. Clements.

This Panel believes that meaningful consultation with community members and other stakeholders (such as, in this case, residents and officials of the RM of St. Clements) is essential in the process of choosing sewage and water treatment alternatives. The Public Participation Guidelines contained in Manitoba's *Principles and Guidelines of Sustainable Development* provide clear direction as to how these should occur. These state:

- (a) *establishing forums which encourage and provide opportunity for consultation and meaningful participation in decision making processes by Manitobans;*
- (b) *endeavouring to provide due process, prior notification and appropriate and timely redress for those adversely affected by decisions and actions;*
- and*

(c) striving to achieve consensus amongst citizens with regard to decisions affecting them.

The Panel notes that forums that “encourage and provide opportunity for consultation and meaningful participation in decision-making processes” evidently had not been held for this project, or if held had not been effective in soliciting input. The process appears not to have been followed, partially through inadvertent focussing on the money required for the project, and partially through ignorance of what was required to involve the citizens of the municipality. There appears to have been little or no “striving to achieve consensus amongst citizens with regard to decisions affecting them” as required in the *Guidelines of Sustainable Development*.

Commission Advice

- **In view of the difficulties encountered by those concerned, and the fact that the communities involved have been living under a boil-water advisory for over three years, it is the advice of this Panel that the Minister direct the assignment of a single staff person to the RM of Brokenhead water/wastewater project to take the lead in assisting the municipality and community members interacting with the many governmental organizations (federal, provincial, and the Regional Health Authorities) to conclude this project.**
- **Further, it is the advice of this Panel that such a protocol should also be put into place for future projects such as this, in order to make this difficult terrain easier for both elected local government officials and other concerned citizens to navigate to get the information and approvals necessary to move forward in a timely fashion.**
- **It is also the advice of this Panel that the Minister instruct Departmental staff to prepare a Public Participation Guide for proponents, based on the Principles and Guidelines of Sustainable Development and that this be incorporated into the Department’s criteria for assessing proposals.**

6.6 Sewage Treatment Issues

This Panel concluded that lagoon technology is an effective and robust means of primary and secondary domestic wastewater treatment for small communities. However, sustainable development requires that excess nutrients be removed through tertiary treatment, to protect downstream ecosystems from eutrophication.

While the Panel was directed by the Minister to ensure that its recommendations were consistent with the *Principles and Guidelines of Sustainable Development*, there was no evidence provided to the Panel to demonstrate that these were considered by Manitoba Conservation in its own review of the Proposal. For example, the Panel observed that the

Proponent considered constructed wetlands only after the idea had been introduced by an intervenor. Manitoba Conservation had not provided information about engineered wetlands as an alternative, or as an adjunct to sewage treatment, to either the proponent or to the interested community members.

The Panel was struck by the fact that much of the controversy arising over the wastewater treatment proposal centred on the choice of the location of the proposed new lagoon. The guidelines for buffer zones between such lagoons and residences or built up areas have been under review since 1985 but have no regulatory standing except as they are incorporated into environmental licences. The Panel also noted that the existing guideline had not stopped the location of a mobile home within the 300-metre buffer zone.

The Panel agreed that the potential need for expropriation should not stop the municipality from proposing, nor Manitoba Conservation from approving, the site which best meets the long term public and environmental health needs of the community. Manitoba Land Management Services, an arms length organization of the Province of Manitoba, exists to assist local governments with the valuation and expropriation processes.

Commission Advice

- **It is the advice of this Panel that Manitoba Conservation state clearly that lagoon technology is an effective and robust means of domestic wastewater treatment for small communities.**
- **It is the advice of this Panel that engineered (i.e., constructed) wetlands be given early consideration to provide tertiary treatment of sewage lagoon effluent, or as a means, on their own, to provide total treatment of municipal sewage in small communities in Manitoba.**
- **It is the advice of the panel that the limitations to the use of ground water resources related to inadequate handling of human sewage be disseminated in the community so that effective monitoring of any leakage of sewage systems gains general public support.**

6.7 Sustainable Development

Decision-making based on full cost accounting of the life-cycle costs of the project alternatives is required to enable the least expensive alternative to be chosen appropriately. To do otherwise will bias the choice and reduce the likelihood of a solution that conforms to the *Principles of Sustainable Development*. The established policies and objectives of the government of Manitoba (*Manitoba Nutrient Management Strategy*, *Manitoba Water Strategy*, *Lake Winnipeg Action Plan*, and the *Objectives, Guidelines, and Standards for Water Quality*) need to be followed and respected in the issuance of a licence to the RM of Brokenhead and other such applications.

The Panel agreed that the installation of an RO water treatment system, given adequate maintenance, would provide the RM of Brokenhead with a water supply of sustainable quality consistent with the requirements of a healthy community. At the same time, the use of such high quality water for all domestic purposes appeared to the Panel to be extravagant. Full-cost accounting or life-cycle costing of the water source and treatment options will assist arrival at the appropriate decision on this matter.

In approaching the development of water treatment in rural areas, both the Manitoba Water Services Board and the regulatory arm of Manitoba Conservation appear to assume that historical urban water consumption rates are appropriate. In fact, rural Manitobans have much to teach urban dwellers about water stewardship. The water treatment portion of the RM of Brokenhead proposal assumed water consumption patterns similar to those in urban areas.

The Panel noted while water conservation measures are being publicly promoted by Manitoba Conservation and the City of Winnipeg already, there was no reference to the need for water conservation in this application. Nor did Manitoba Conservation raise issues of water conservation through the TAC.

To be compatible with the *Principles and Guidelines of Sustainable Development*, the licence for the new community system could promote water conservation by encouraging the retrofitting of low-volume flush toilets, the use of flow restrictors in shower heads, the use of efficient front-loading washing machines, and the reuse of gray-water for irrigation in the growing season. If these opportunities are not taken, it is doubtful that it will be possible to associate the installation of the new water/sewage system with the *Principles and Guidelines of Sustainable Development*.

In general, the Panel notes that Manitoba Conservation (Approvals Branch) and the Manitoba Water Services Board did not appear to view the promotion of the provincial sustainable development policies as a part of their mandate. Yet without this, proponents will not incorporate them into their planning and opportunities for real improvements will be lost. It is much less costly and more efficient to incorporate these guidelines into new developments than to retrofit existing ones.

Commission Advice

- **It is the advice of this Panel that the Minister direct Department staff to incorporate existing relevant provincial policies (including Manitoba's Principles and Guidelines of Sustainable Development, the Manitoba Nutrient Management Strategy, the Manitoba Water Strategy, and the Lake Winnipeg Action Plan) into its criteria for review of development proposals and that the results of this be included in the Public Registry.**

- **It is the advice of this Panel that the Minister should incorporate the existing 300-metre buffer zone guideline into regulation. The regulation should include a provision specifying that, once a lagoon has been commissioned, no new residences should be permitted within the buffer zone.**
- **It is the advice of this Panel that the Minister direct Departmental staff to advise Proponents that evaluation of potential lagoon sites will give priority to public and environmental health issues and that local governments be directed to Manitoba Land Management Services to assist them in expropriation if necessary.**
- **It is the advice of this Panel that the Minister direct the Department to develop means to encourage municipalities to promote water conservation, through various methods and approaches, including increasing water charges as consumption increases and the installation of technologies that reduce consumption. This information should be provided to all applicants for water and sewer treatment developments.**

7. Panel Recommendations

Recommendations are made pursuant to the terms of reference of the hearing and are designed to incorporate, consider, and directly reflect, where appropriate, the *Principles of Sustainable Development* and *Guidelines for Sustainable Development* as contained in the *Sustainable Development Strategy for Manitoba*.

It is recommended that a license for the RM of Brokenhead Sewage and Wastewater Treatment Facilities be granted subject to the following conditions:

7.1 Sewage Treatment Technology

- 7.1.1 It is recommended that tertiary treatment of the sewage effluent, and a timeline for implementation be incorporated into the licence.

7.2 Siting of the Lagoon System

- 7.2.1 It is recommended that a licence be granted for a community sewage treatment system at a site selected from the two alternative locations indicated below:
- a) use the existing lagoon site by converting the existing two-cell lagoon to a primary cell and construct a new secondary cell to the west across the road. Land expropriation may be necessary; or
 - b) acquire the land east of the site proposed by the proponent to allow the lagoon design to be modified, to allow at least a 30-m buffer zone between the toe of the lagoon dike and the boundary of the Devil's Creek riparian zone, and to allow an adequate setback between the lagoon and the nearby residences.
- 7.2.2 It is recommended that, should option (b) be selected, the land required for the lagoon be assembled once the plan is approved. Expropriate if necessary.
- 7.2.3 It is recommended that the forcemain be routed along road allowances rather than in the riparian zone of Devil's Creek, even though Devil's Creek has been extensively channelized.
- 7.2.4 It is recommended that sufficient land be made available to ensure that tertiary treatment can be accommodated in the future for any site that is licensed now.
- 7.2.5 It is recommended that the lagoon infrastructure be planned to include the addition of future tertiary treatment to achieve the objectives required as part of the *Manitoba Nutrient Management Strategy, Water Strategy, Lake Winnipeg Action Plan, and the Principles and Guidelines of Sustainable Development*.

7.3 Discharges to Devil's Creek

- 7.3.1 It is recommended that the discharge rate to Devil's Creek for treated effluent from the lagoon be adjusted to prevent scouring and erosion.
- 7.3.2 It is recommended that all reject water from the water treatment system, if installed, be routed through the lagoon on a year-round basis.

7.4 Public Health Concerns

- 7.4.1 It is recommended that the licence specify that ongoing mosquito monitoring be required in the sewage lagoons, and that emergent vegetation in the lagoons be controlled, in order to prevent their use as habitat by the mosquito vector of West Nile virus.

7.5 The Residential End of the System

- 7.5.1 It is recommended that a gravity sewer system with lift stations be a given full cost analysis and compared to the proposed system (in which individual private holding tanks would be connected to a low-pressure forcemain system) with the objective of identifying the system that will effectively handle wastewater at the lowest cost to the individual homeowner.
- 7.5.2 If the RM of Brokenhead proceeds with a low-pressure system, it is recommended that the responsibility for the integrity of existing individual waste water systems be taken by homeowners, and that a plan for regular inspections by a responsible authority be initiated to halt groundwater contamination.

7.6 Water Supply

- 7.6.1 It is recommended that the proposed well location be licensed only after alternative locations and alternative treatment scenarios have been adequately evaluated, and if these are subsequently rejected.
- 7.6.2 It is recommended that alternative well sites be evaluated to the southeast and east of Henryville with the intent of finding a source that will provide water of sufficient quality for 20 years without resorting to the use of expensive membrane technology.
- 7.6.3 It is recommended that life-cycle costs of proposed well sites and water treatment procedures be evaluated rather than capital costs alone.
- 7.6.4 It is recommended that the capability of the upper aquifer underlying the RM of Brokenhead to self-remediate be quantified in such a manner that the safety of using the water from the lower aquifer as a source of domestic water for a 20-year period can be estimated.
- 7.6.5 It is recommended that water treatment technologies other than reverse osmosis be considered as being more suitable if the well is sited to optimize 20-year water quality.
- 7.6.6 It is recommended that the water treatment system to be installed meet the revised recommendations of the Federal/Provincial Chlorinated Disinfection By-Products Task Group, expected to be released later in 2003. Since Manitoba Conservation (now Water Stewardship) is represented on this task group, it should be unnecessary to await formal release of the revised recommendations

7.7 Sustainable Development

- 7.7.1 It is recommended that sewage/septage treatment in the new system incorporate nutrient removal to restore the water to the quality compatible with the receiving waters of Devil's Creek.
- 7.7.2 It is recommended that the licensed capacity of the new wastewater system for the RM of Brokenhead be designed to encourage water conservation. For instance, the designed size of the system should be linked to the capacity needed if low-volume toilets and restrained water use is in place. Replacement of flush-toilets within the community with approved low-volume units would be part of the overall project.

Appendix A List of Registered Presenters

Name	Organization
Anderson, Rob	University of Winnipeg, Manitoba Health
Bichlbauer, Armeline	Private
Boonstra, Gerrit	Private
Boswick, Robert	Manitoba Conservation
Cousin, Jerry	J. R. Cousin Consultants Inc.
Currie, Orvel	Rural Municipality of Brokenhead
Dalmyn, Ron	Devil's Creek Watershed Coalition
Didiuk, Ivan	Canada Manitoba Infrastructure Secretariat
Dubowits, Herb	St.Clements Ratepayers Association
Dudeck, Glen	Rural Municipality of Brokenhead
Dyck, Jeff	J. R. Cousin Consultants Ltd.
Fiddler, McLeod	Devil's Creek Watershed Coalition
Fisher, Kathy	Fisheries and Oceans Canada
Gering, Gail	Devil's Creek Watershed Coalition
Henrichsen, Ernst	Rural Municipality of St. Clements
Knights, Douglas	Devil's Creek Watershed Coalition
Korolewich, Phil	Devil's Creek Watershed Coalition
Kristofferson, Keith	Fisheries and Oceans Canada
MacDuff, Jodine	Prairie Farm Rehabilitation Administration
McDonald, Rodney	Private
McGarry, Pat	Prairie Farm Rehabilitation Administration
McKernan, Mike	TetrES Consultants Inc.
McNaughton, Dan	Canadian Environmental Assessment Agency
Ominchinski, Wayne	Rural Municipality of Brokenhead
Pedersen, Arne	Water Services Board
Pescitelli, Lisa	Private
Phipps, Graham	Manitoba Conservation
Pohl, Karl	Private
Porhowinik, Lawrence	Private
Sharward, Richard	Private
Shearer, Robert	Devil's Creek Herb and Berry
Shumilak, Bert	Private
Sinew, Jane	Devil's Creek Watershed Coalition
Sinew, John	Devil's Creek Watershed Coalition
Tymko, Al	Rural Municipality of Brokenhead
Williamson, Dwight	Manitoba Conservation
Winnemuller, Jason	Private

Appendix B List of Exhibits

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2.	<i>"Terms of Reference for Clean Environment Commission Hearings on the Water/Sewer Infrastructure Project in the Rural Municipality of Brokenhead"</i>	5
3.	<i>"Submission to the Clean Environment Commission Hearing: Rural Municipality of Brokenhead - Garson/Tyndall/Henryville Water/Sewer Project". Manitoba Conservation, Environmental Approvals. Submitted by Robert Boswick, Manitoba Conservation.</i>	19
4.	<i>"R. M. of Brokenhead: Village of Garson: Community of Tyndall: Community of Henryville: Municipal Water and Sewer System Pre-Design Report". J. R. Cousin Consultants Ltd. Submitted by Al Tymko, Rural Municipality of Brokenhead.</i>	25
5.	<i>Notes: "Public Hearing - May 15, 2002 7:00 p.m." Submitted by Al Tymko, Rural Municipality of Brokenhead.</i>	25
6.	<i>"R. M. of Brokenhead: Garson, Tyndall and Henryville Municipal Water and Sewer System Environmental Hearing: June 19 - 20, 2003". Submitted by Orvel Currie, Rural Municipality of Brokenhead, (Counsel).</i>	76
7.	<i>Brief: "Presentation to Clean Environment Commission, June 19, 2003". Submitted by John Sinew, Devil's Creek Watershed Coalition.</i>	86
8.	<i>Memorandum, dated February 7, 2003, from B. McTavish, Manitoba Conservation to L. Strachan, Manitoba Conservation. Submitted by John Sinew, Devil's Creek Watershed Coalition.</i>	86
9.	<i>Letter, dated May 14, 2002 from Jan Roberts, Manitoba Office of the Chief Medical Officer of Health, to Mayor and Council, Village of Garson. Submitted by John Sinew, Devil's Creek Watershed Coalition</i>	86
10.	<i>Brief: "Presentation to the Clean Environment Commission at Garson on June 19 and 20, 2003". (With attachments). Submitted by Richard Sharward.</i>	112
11.	<i>"R. M. of Brokenhead: Environmental Submission for the Proposed Garson/Tyndall/Henryville Water/Sewer Infrastructure Project". March 2002. J. R. Cousin Consultants Ltd. Submitted by Jerry Cousin, J. R. Cousin Consultants Ltd.</i>	141
12.	<i>"December 2, 2002 and December 20, 2002 information requests from Manitoba Conservation and corresponding response from JRCC". Submitted by Jerry Cousin, J. R. Cousin Consulting Ltd.</i>	141
13.	<i>"June 20, 2002 information request from Manitoba Conservation and corresponding response from JRCC". Submitted by Jerry Cousin, J. R. Cousin Consulting Ltd.</i>	141
14.	<i>"February 26, 2003 information request from the Prairie Farm Rehabilitation Administration and corresponding response from JRCC". Submitted by Jerry Cousin, J. R. Cousin Consultants Ltd.</i>	141

³²Page number on which this exhibit was introduced as recorded in the hard copy of the official transcript of the hearing. This transcript is available at the offices of the Clean Environment Commission.

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15.	<i>Letter dated January 28, 2003 from Jason Winemuller to Beth Thomson, Fisheries and Oceans Canada, submitted by Jason Winnemuller.</i>	187
16.	<i>Map: "GR2002 -1-1: Selkirk (NTS 62I2): Capital Region Mineral Resource Potential and Overburden Thickness". Manitoba Industry Trade and Mines. Submitted by Jane Sinew, Devil's Creek watershed Coalition.</i>	228
17.	<i>Brief, untitled, submitted by Gail Gering.</i>	247
18.	<i>Brief: "Brokenhead - Garson Lagoon & Water Plant, June 20/03". Submitted by Ron Dalmyn, The Organization.</i>	259
19.	<i>Visual Projections: "Potential for Application of Engineered Wetland(s) for Wastewater and Effluent Treatment: Presentation for Devil's Creek Watershed Group to Manitoba Clean Environment Commission". June 20, 2003. Submitted by Mike McKernan, TetrES Consultants Inc.</i>	293
20.	<i>"Devil's Creek Watershed Coalition Presentation at the Public Hearing for Proposed Garson/Tyndall/Henryville Water/sewer Infrastructure Project by the Municipality of Brokenhead: Garson, Manitoba June 19 and 20, 2003". Devil's Creek watershed Coalition. Submitted by Jane Sinew, Devil's Creek Watershed Coalition.</i>	332
21.	<i>Video: "Tyndall Lagoon Effluent Discharge June 11, 2003 8:00 A.M." Submitted by Jane Sinew, Devil's Creek Watershed Coalition.</i>	332
22.	<i>Map: "Groundwater Availability Study Selkirk Area: Potentiometric Surface Figure 7". Department of Natural Resources, Province of Manitoba. Submitted by Jane Sinew, Devil's Creek Watershed Coalition.</i>	332
23.	<i>Brief, untitled, submitted by Douglas Knights.</i>	345
24.	<i>Brief, untitled, submitted by Phil Korolewich.</i>	366
25.	<i>Aerial Photographs (5) and guide submitted by John Sinew, Devil's Creek Watershed Coalition.</i>	366
26.	<i>"Presentation to the Clean Environment Commission Monday, August 18th, 2003". The Federal Government Project Team. Submitted by Dan McNaughton, Canadian Environmental Assessment Agency.</i>	472
27.	<i>Brief, "Macrophyte and Invertebrate Communities in Devil's Creek Over a Time Span of 28 Years". Dr. E. Pip, University of Winnipeg, submitted by Eva Pip.</i>	506
28.	<i>Visual Projections: "Clean Environment Commission Hearings: Water/Sewer Infrastructure Project in the Rural Municipality of Brokenhead". Submitted by Rodney McDonald.</i>	526
29.	<i>Brief, "Infrastructure", submitted by Robert Shearer, Devil's Creek Herb & Berry.</i>	540
30.	<i>Brief, "Proposed Low Pressure Sewer and Water Systems LUD of Tyndall/Garson", submitted by Gerrit Boonstra with attached map.</i>	565
31.	<i>Zoning By-law, "3.3.22 - Sewage Disposal". Village of Garson. Submitted by Phil Korolowich.</i>	566
32.	<i>Brief, "The Creek That Used to Be", submitted by Bert Shumilak.</i>	570
33.	<i>Brief, "Presentation to the Manitoba Clean Environment Commission, submitted by Karl H. Pohl.</i>	575
34.	<i>Letter, dated June 20, 2003, from Ernst Henrichsen, Rural Municipality of St. Clements. Submitted by Ernst Henrichsen, Rural Municipality of St. Clements.</i>	626
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37.	<i>Addendum</i> , untitled, to <i>Brief</i> , untitled (Exhibit 23), submitted by Douglas Knights. Submitted by Douglas Knights.	652
38.	<i>Brief</i> , untitled, submitted by Armeline Bichlbauer.	663
39.	<i>Visual Projections</i> , "R. M. of Brokenhead: Gason, Tyndal and Henryville: Engineered/Constructed Wetlands". August 18, 2003. Submitted by Jeff Dyck, J. R. Cousin Consultants Ltd.	694